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MOTOR AGE

Volume XXXIX
Number 9

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CHICAGO, MARCH 3, 1921

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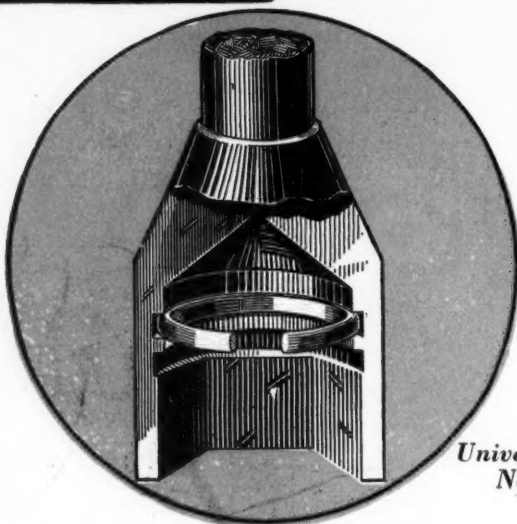
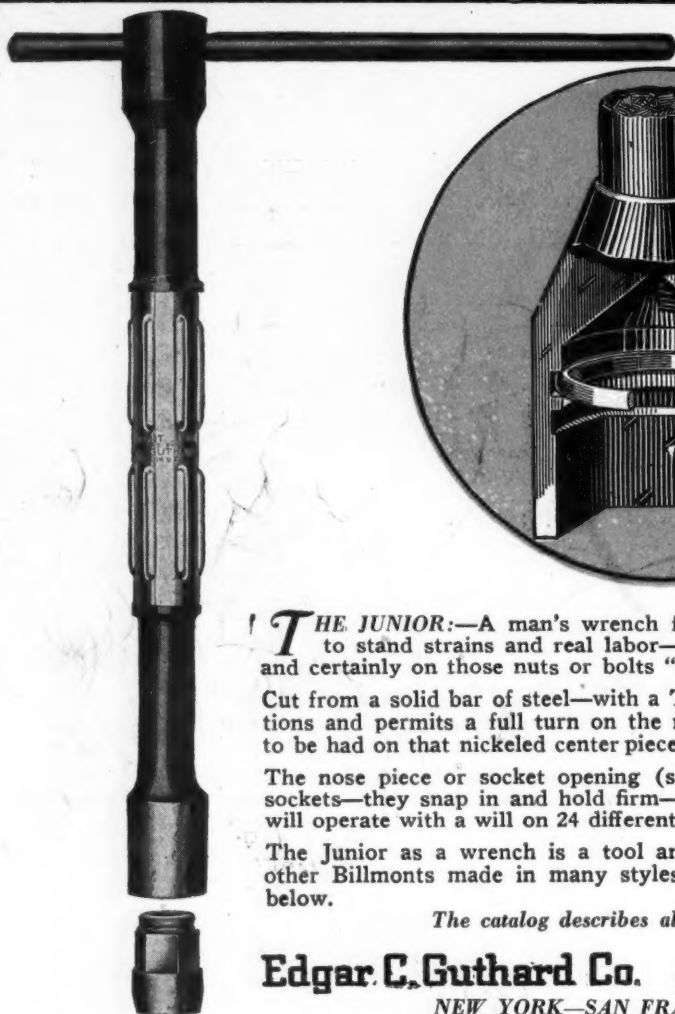
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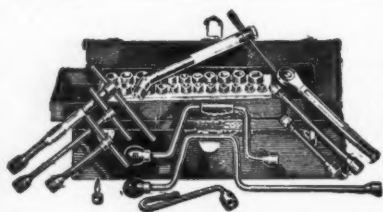
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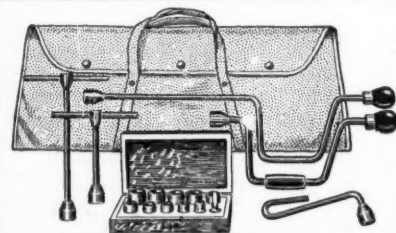
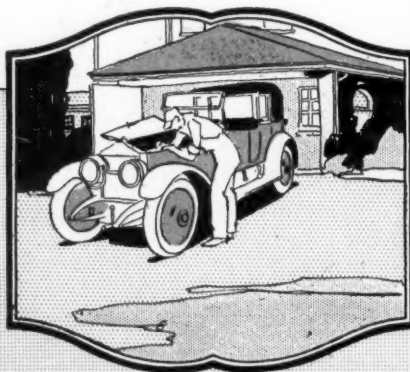
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Billmont No. 400 Carrying Kit
appeals to the mechanic or repairman because it "covers the ground" without too many pieces.

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with Interchangeable Sockets

MOTOR AGE

Published Every Thursday by

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SODERWAND

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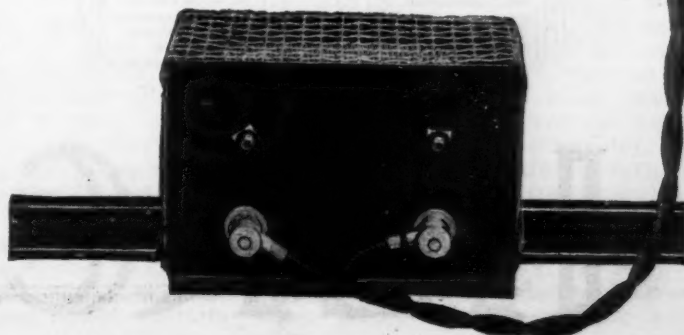
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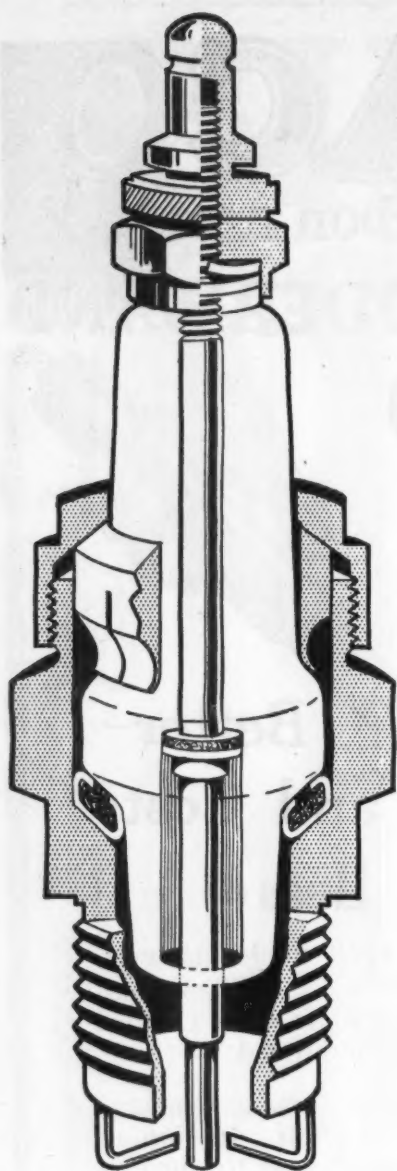
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of metal against porcelain.*



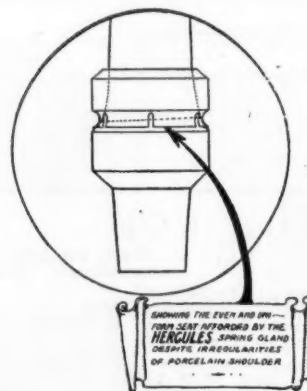
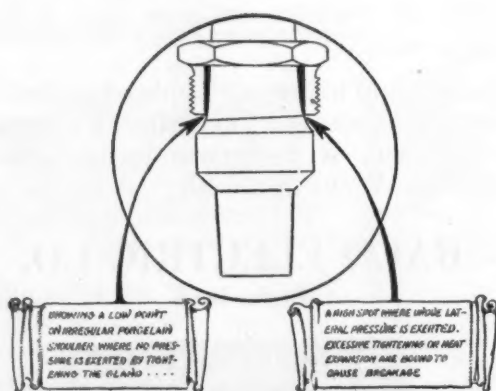
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MOTOR AGE

LET A LITTLE SUNSHINE IN

By TOM
WILDER

*A Few Hints and
Methods for Obtain-
ing That Valuable
Asset, Daylight, and
Utilizing It to the
Profit of the Dealer*

IN TWO PARTS
PART I



THE sun is the source of all power. It is the force which drives the world. It is the source of the energy that induced the growth which produced our coal and oil fields. It is the source of the energy which evaporates sea water forming it into clouds and carrying them to the high places whence they condense and eventually form rivers which flow back to the sea turning the wheels of our factories as they go.

It has been demonstrated that every plant needs a certain number of hours of light to mature, and beyond a certain

stage plants will not grow without sunlight.

Human beings try to overcome the handicaps of nature and grow in dark places, but it only takes a comparative glance at the children of the tenements and those of the country to judge of the success of the venture. People cannot exist and grow in the dark any better than plants. They sometimes try, but the experiments are always failures. Deprived of a certain amount of sunlight a man soon becomes morbid and grouchy. The darkness reacts on his disposition making him think more of his troubles, than of the duty he has to perform. Many people exist during the week

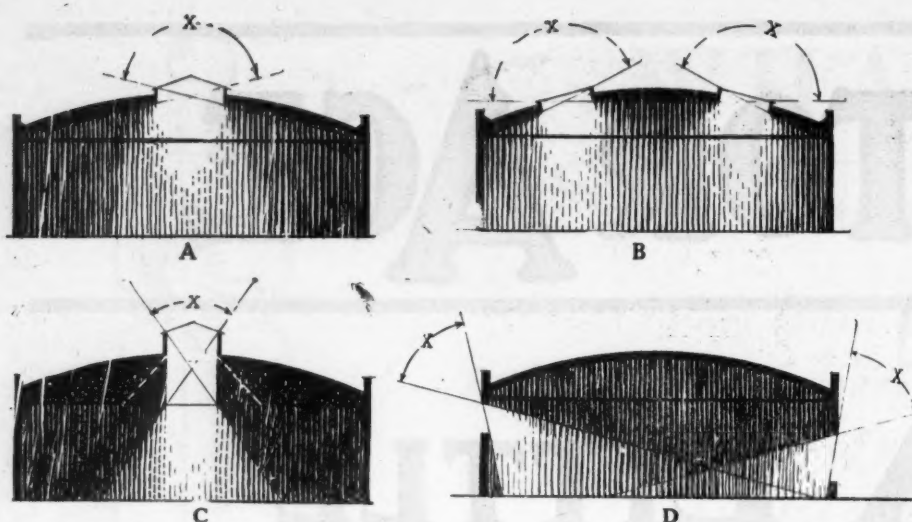


Fig. 1—These diagrams are designed to illustrate the value of the different methods used in lighting a one-story garage. A is the regulation center skylight building where the aisle space through the center is well lighted, but the sides are rather dark. B represents the building with skylights alternately on one side and then on the other. This gives much better distribution of light than A. The center is not so light, but the sides are much improved. C represents a garage with light shaft coming down through a plastered ceiling. Better distribution could be had by cutting down the height above, and opening out the shaft beneath as indicated by the white dotted lines. At D a comparison of small high windows is made with a large low window, the light coming from the same angle in both cases. The small one gives the best results in spite of the fact that window space is usually figured in percentage of wall space.

simply in anticipation of the outdoors and sunshine they expect to experience on Sunday.

All this goes to show that light and sunshine are the big things in this world and while this alone will not make a man happy and contented it goes a long way toward making him contented while he is working to get his share of the other coveted things.

Figuring from the standpoint that contented employees are the outcome of light and pleasant workrooms, it is not hard to go a little farther and show that discontented men working in the dark produce slipshod work.

Inability to see distinctly is always

a good alibi to slip over careless work and careless work continued will sooner or later lead to a sad end. When a man uses all his energy to do a job he cannot use more, and if he must use energy to see, it must be at the expense of good work or speed.

Therefore, we would say in the words of the old Sunday School song, "let a little sunshine in," though here we are not speaking figuratively, but literally, we want the genuine article.

After we get the actual sunshine in the shop the sunny dispositions will follow—no doubt of it at all unless we have been groping in the dark so long that pessimism is chronic.

Daylight is the most valuable asset the garageman can possess, and it is the purpose of this article to point out the easiest and most direct method of getting it.

Man cannot work to advantage in darkness, and artificial light is little better unless supplied in such quantities that the cost is prohibitive. Where the work is such that it can be illuminated directly on a bench good results may be obtained, but when working on a car the light is either shining in the workman's eyes or he is working in his own shadow most of the time.

Daylight on the other hand is brighter and more diffused. It comes in such quantities that it is not appreciated and little effort is made to admit it to our buildings in sufficient volume to do much good.

In the first place we must remember that all our light comes from the sky. When the sun is shining the sky is a great inverted bowl that glows as would a direct indirect lighting fixture except that its area is brighter.

If we could make the whole surface of our ceiling and side walls glow with a brightness equal to the surface of a 24-in. frosted globe containing a 100-watt nitrogen lamp, we would still fall short of the illuminating power of an overcast sky, not real cloudy but overcast with the sun hidden by light clouds or mist.

Considering then, that all our natural illumination comes from the sky and seldom from points less than 10 deg. to 20 deg. above the horizon, it will be seen that side windows will contribute very little toward the admission of light that comes mainly from above. The diagram (Fig. 3) will show this better than words can tell it. Here while the building is pretty well separated from surrounding buildings and the windows are of ordinary size, fully 45 per cent of the floor is badly lighted and only 30 per cent well lighted.

We often see statements of the percentage of glass in an outside wall. This



This photograph gives a fairly good comparison of the value of side windows and skylights. Note how much brighter the illumination is out in the center than along the bench, although there is plenty of open space outside



Side windows have not done much for this floor, although there are no buildings on either side. The designer simply hasn't taken advantage of the situation

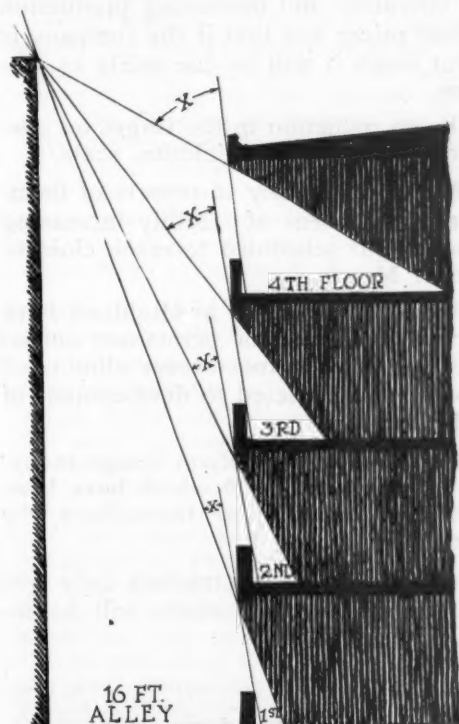


Fig. 2—This diagram shows the difference in the quantity of light that windows of the same size will deliver when located in different degrees of advantage with respect to the source of light

really means nothing since the upper half of a wall transformed into glass is more than double the value of the lower half (see Fig. 1), and if another building cuts off a view of the sky neither area will be worth much for the purpose of admitting good usable light. Specifying 50 per cent or 75 per cent of glass in a wall that is flanked by another building is like buying land that is covered with water.

The higher the floors are the more light they will receive from side windows (see Fig. 2) because of the wider range of light they receive from the sky. Of course, if the buildings were detached out on the prairie, this would

all be different and all floors would have an equal proportion of light, but since most of our buildings are in towns or cities, care must be taken to utilize the space according to its value.

Referring again to Fig. 2, the light filtering in through the first floor windows is of little use as far as work is concerned. The second floor gets a little more, but only sufficient to light a bench which might extend along the wall—perhaps a battery shop, long and narrow, with charging bench on the dark side. The third floor has a strip some 7 or 8 ft. wide which could be utilized for something, but the fourth floor which is accessible to skylights and really needs no side windows gets more opportunity for side light than all the others combined and here all of the delicate operations—those requiring good light to perform properly should be made. The benches should extend along under the side windows where men can get the best light on their

work; while painting, body and chassis work should be done under skylights, which give a fine even diffused light illuminating every part of the mechanism.

It must be understood that in these diagrams we have not taken reflected light into consideration. Most garage and repair shop floors are so dark that little light is reflected from them and almost all of the contents, machinery, cars, etc., are dark, light absorbing and light obstructing objects.

We have been in some service stations and garages where the men and everybody else complained of the dark and gloomy atmosphere when a simple remedy like washing the windows would add greatly to the light entering the place. Not long ago we went into a dealer's place which had been converted from a skating rink to an automotive establishment. There was not an over abundance of windows in the place, but the dealer figured by painting the whole interior white he would gain at least some of the advantage more windows offered. This was done and it was a revelation to see the results.

Walls and ceilings may be painted white or whitewashed to good advantage but to get the most benefit from reflected light the floor should be made white and we know of no way to do this except by the use of white tile which is vitreous and would not be discolored by oil, grease and dirt. The most up-to-date service stations are scrubbed every day or two and if that expense is warranted, why not a tile floor where the light conditions demand every possible effort?

Since we have shown that the light enters mainly from above, it naturally strikes the floor first. If this is white instead of nearly black, as usual, the light will be thrown up to the ceiling and side walls and back to the floor, diffusing itself all through the room.

(TO BE CONCLUDED)

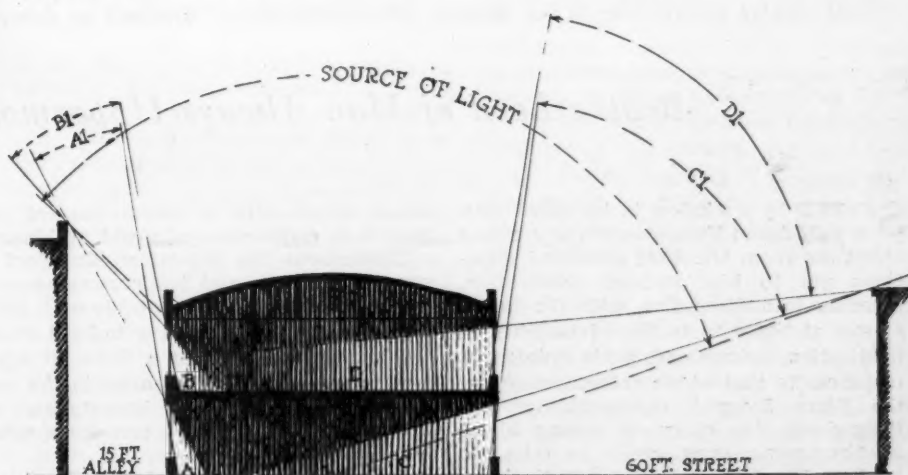


Fig. 3—A window acts just like the lens of a camera. Light from the sky passes through the window and is thrown upon the floor or the opposite wall, while dark objects such as trees or buildings are projected in the form of shadows. If the window is small enough a perfect inverted image of landscape and sky may be discerned on the opposite wall or floor. Ordinary large windows diffuse the light too much to produce an exact image, but the general effect of light and shade is there. In the figure the section of sky A1 is reproduced at A, the section B1 at B, the section D1 at D, etc. The visible portion of the sky is the source of light and the more advantage we take of it by supplying openings, the more light we will get

Henry Ford Tells Future Plans

Details Factory Policies and Also Goes Into Present Conditions at Plant in an Exclusive Interview to a Representative of The Class Journal Publications

By R. H. BURLINGAME

Of the Detroit Office of The Class Journal Co.

DETROIT, Feb. 25—In an exclusive interview with a representative of the Class Journal publications Henry Ford today made the first detailed statement of factory plans and policies for publication. Outstanding facts in refutation of the varied rumors and reports that have been circulated are:

That 15,800 employees were working in the Highland Park plant today.

That 2860 cars were produced in Highland Park and branches yesterday.

That 2502 engines were built at Highland Park Wednesday.

That there were 95,000 cars in the hands of dealers and 30,000 in process of construction at the branches when the Highland Park plant closed Dec. 24.

That 57,000 cars were sold during January, liquidating the 30,000 completed in the branches and 27,000 of the dealer stocks.

That retail sales for the first half of February were 42,000.

That total production for February will be 35,000.

That sales, if the ratio continues through February, will approximate 85,000, assuring liquidation of 50,000 more of the dealer stock.

That dealer requirements for March are 70,000, nec-

essitating a production schedule of 3100 daily, within 1100 of the record for daily production.

That working forces and production will be increased steadily until normal production is reached.

That continued operation and increasing production is contingent on steel prices and that if the company is forced to again shut down it will be due solely to prohibitive steel prices.

That there will be no reduction in the wages on specific jobs and no reduction in the minimum scale.

That the Ford Motor Co.'s reply to reports of financial stress is the announcement of steadily increasing working forces and output scheduled to reach close to normal by the end of March.

That the executives now in charge at Highland Park and River Rouge will constitute the permanent official personnel with official titles in most cases eliminated and concerted efforts being directed to development of Ford products and policies.

That 2700 men were employed at River Rouge today, 1700 having been added to the 1000 which have been working there without interruption throughout the period of depression.

That a production schedule of 100 tractors daily was started at the Rouge plant today which will be increased as demand requires.

Brotherhood of Man Always Uppermost in His Mind

SEATED by a window in his office with a half dozen Ford executives grouped about the room Mr. Ford answered questions put to him without reservation, entering into discussion with the interviewer at times as to the advisability of publication, subordinating his opinion in instances to that of his subordinates and the Class Journal representative and throughout the interview lasting about an hour never once sought to take the lead or divert the trend of questions.

With his chair tilted, legs crossed and his hands clasped behind his head, following a cordial greeting to the interviewer, the most talked of man in the industrial world today adjusted himself to a position of comfort and with patient forbearance and a smile playing about his face continually listened and replied promptly to questions of

minor detail with as much interest as though in conference on world problems.

Throughout the interview Mr. Ford's sense of fairness and justice was apparent and indeed no man can sit with him five minutes and not leave imbued with the idea that he is just a little bit bigger than the average celebrity in the industrial world and that honesty and a square deal are cardinal principles with him.

That the idea of the brotherhood of man is at all times uppermost with him is ever apparent and an interposition now and then that crops out almost involuntarily evinces his trend of thought and his determination to mold his policies and develop his projects to the end that mankind in general may benefit.

It was suggested at the outset that the interview was for publication in

magazines devoted solely to the upbuilding of the automotive industry rather than for public consumption and Mr. Ford readily acquiesced in the suggestion that questions vitally affecting the industry be put to him.

It was during his reply to a question as to plans for factory operations looking to return to normal production that Mr. Ford sounded the big note when he declared that operations in April and May and for the future were contingent on the price of steel, adding:

"If we have to close again it will be due to the attitude of steel manufacturers."

And right here the man who talks in hundreds of millions showed his remarkable grasp on the details of his organization when in emphasizing his point that steel is the big factor he ap-

proximated the weight of the top, tires, glass and floorboards for comparison.

The issue was brought up when Edsel Ford suggested that not only steel prices but prices of all materials would have an effect, his father stressing the point that steel was all important and prohibitive prices the real handicap to uninterrupted production.

Frequently throughout the interview Mr. Ford made reference to financiers, referring to them as money sharks and there was a note of exultation in his voice when in answer to the question as to whether he cared to discuss the many reports of financial stress and alleged efforts to float a loan he said:

"The best answer to that question is employment and production figures just given you and the fact that we are going to build 80,000 cars in March. We must pay for materials and labor and that means a considerable sum."

The many rumors regarding conditions at Highland Park and the reports giving the number of men employed in totals ranging from 5000 to 20,000, were set at rest when Mr. Ford declared that since the reopening of the plant Jan. 31 with approximately 10,000 men the force had been increased steadily until today's total was reached. And the force will be increased in conformity with sales and demand, he said, until normal operations again are resumed.

SUPPLUS CARS RAPIDLY BEING LIQUIDATED

It was made plain however that the force never would reach the total employed during the peak last year for it has been demonstrated beyond question that the maximum of production requirements can be reached with a materially decreased force due to greater efficiency and more conscientious effort. In this connection Mr. Ford said:

"It is the universal policy and the logical course to minimize operation and production costs and evidence multiples that by stimulating men to greater effort and more willingness to give the best that is in them, the volume of labor required for a given task can be reduced greatly. Our office force today practically is what it was under pre-war conditions in 1914."

When it was suggested that production of 2860 cars yesterday with a force of only about 16,000 was extraordinary Edsel Ford offered the explanation that much of the machining of material had been done prior to the shut-down in December and in consequence production with the minimum force was made possible.

Regarding reports of a car surplus of 125,000 at the time the plant shut down Mr. Ford said there were no finished cars save 95,000 in the hands of dealers and 30,000 in transit and in process of construction at the assembly branches, construction of which was completed during January. During the same month he said retail sales were 57,000 materially reducing the surplus which he said rapidly was being liquidated by constantly increasing sales.

Turning to W. A. Ryan Mr. Ford asked

if January sales had not established a record for that month and Ryan replied that no actual comparison had been made but that the total was probably a record.

With the ratio of sales continuing Mr. Ford said cars now held by dealers soon would be in the hands of consumers necessarily compelling an increase in output to meet current demand.

The Highland Park plant builds finished cars for Michigan and a part of Ohio and builds all engines and other mechanical parts which are shipped to the branches daily for assembling. The total built in the main plant and branches constitutes the daily output, with the Highland Park plant turning out about 350 cars as its quota.

Repudiation of the many reports concerning Ford activities is emphasized not only in operations in the Highland Park plant but in the actual reopening today of tractor production at River



Henry Ford

Rouge where a force of 2700 is employed, manning the blast furnaces, building tractors and working in various capacities. Although the Rouge plant never had been closed, Mr. Ford said, production of tractors had been stopped pending completion of preparations for resuming manufacture by the new system of pouring iron put into effect today.

Mr. Ford appeared particularly pleased to respond to the question regarding reported cuts in wages among his employees.

"There has been no reduction in the wages for specific jobs," said he, "and there has been no reduction in the minimum wage scale. Many foremen and other employees who had been working at higher wages were given opportunity to accept employment on other work at the prevailing scale for the particular job. The effort to minimize hardships by giving them part time work even though it required their accepting wages lower than they had been paid on their regular work apparently was appreciated and all of them welcomed the opportunity offered."

In voicing his optimism and full confidence in the future of the automobile industry Mr. Ford said:

"The war and the unusual activities connected with it followed by the abnormal conditions accompanying the readjustment period brought about an unusual situation in the matter of labor and production and while everyone was for a time swept along on the tide of extraordinary industrial activity it easily was apparent that return to normal must be brought about by curtailment and readjustment all down the line. January was the breathing spell with the Ford Motor Co., following the period of intensive effort. We are all optimists out here and the figures given you are the best evidence that conditions are improving and that a brighter business outlook is becoming increasingly apparent."

In the matter of successors to the men who have left the Ford organization Mr. Ford suggested it was of little consideration who might look after the various activities of the company so long as the combined effort served to develop and promote the policies and ideals. Waving his hand at the group of executives about him he said:

INCLINATION APPARENT TO ELIMINATE TITLES

"These men are all a part of this company. They are all financially interested and to the extent of the limit allowed by the company under its investment certificate system. Let us eliminate the personal equation. This is not a Henry Ford organization but rather every executive and workman is financially interested in the welfare and future of the company. Why Edsel owns 43 per cent of the stock of the Ford Motor Co."

It was demonstrated plainly throughout the interview that the matter of titles for department heads or executives was of minor consideration and in fact there seemed to be the inclination to eliminate titles in most instances with matters of policy and efforts of all departments being directed through conferences of all executives.

Mr. Ford's reply to a question as to who would be delegated with authority to reply for the company to questions that develop from time to time was significant.

"All of us," said he with a smile as he indicated the entire group, the inference being that all questions must be put to the executive conference.

Throughout the interview Mr. Ford maintained an air of composure, smiled constantly and never appeared ruffled even when questions regarding the many attacks and rumors were put to him. Gracious throughout, never attempting to take the lead, seemingly determined to put his questioner at ease and evincing willingness to go into detail in his responses and explanations, his demeanor was calculated to impress the visitor with his humanitarian characteristics and the kindly and generous impulses accredited to him.

Motors Solve Snow Removal Problem

New York's Record Snowfall Disposed of in Short Order by Automotive Equipment Which Prevents Serious Traffic Tie-up

THIS year, for the first time, snow did not catch the city of New York unprepared. A fall of from 12½ to 13½ in. in about 24 hours, the biggest fall in thirty years in that time, was a supreme test for the organization, but the city came through with flying colors. Over 20,000 men and 3,000 vehicles cleared all the specified streets up to schedule and prevented any serious delay in traffic whatever.

There were four features of the city's campaign of material assistance in making this possible. First, the equipment, consisting of 150 tractors, 350 trucks, over 600 push plows, about 150 4-wheel pull plows, 1,800 department carts and 850 contractors' vehicles went to work very nearly on schedule time.

Second, the city's plan, begun last July, of training as many men as possible in four different schools in driving and handling this equipment made efficient work possible. By Dec. 1 these four schools had trained 649 men as drivers of trucks and tractors so that all these men passed their licensing tests and became licensed chauffeurs.

Third, for the purpose of snow removal, the entire city was divided up into small zones, using existing fire zone division with a fire station as the center of each zone. The equipment was distributed in these zones at the fire stations and every man assigned to his zone. At the same time each police station had a list of snow fighting men living on the beats, in that precinct and the police were instructed to telephone to the police station the moment snow began to fall and get a list of the men living on their beats. In this way the auxiliary forces were at their posts by the time the 14-14 call went out.

STREET RAILWAYS AGREE TO REMOVE THEIR SHARE

Fourth, the street railways have about 3,000,000 sq. yd. of surface from which they are required to remove the snow altogether, not merely push it off the tracks onto the street. By agreement, the railway lines were given full streets from houseline to houseline approximating this area of 3,000,000 sq. yd., which they were to clean entirely and which they did clean. In return, they were allowed to clear the tracks with their sweepers and the city took care of the snow thus cleared.

Of the 150 2-ton tractors, sixty-four took care of the section between 14th street and 72d Street with pull plows and two push plows. Below 14th street the 4-ton tractors with push plows handled the main streets, while trucks and push



The snowfall of a single day which the city had to fight and which was a supreme test for the new equipment. This illustration shows one of the new trucks equipped with a pull plow supplementing the efforts of the shovelers

plows cleared the side streets. Above 72d Street and in the Bronx, trucks and push plows and fourteen tractors with pull plows cleared the specified area. In Brooklyn all the trucks and tractors used were stationed in a large Armory and in stable B of the D. S. C. Working from these points, twenty-two tractors and eighty-three trucks with sixty-two pull plows and forty-three push plows cleared the streets specified.

The trucks bought and used by the department for this work were of two capacities. There were one hundred 2-ton Mack trucks, newly purchased, two hundred and twelve 5-ton White trucks newly purchased and about thirty-eight 5-ton trucks which the city had last year. All the tractors were new. They were listed under two capacities, there being one hundred Cleveland tractors listed as 2-tonners and fifty Holt caterpillar tractors listed as 4-tonners. The push plows were all Champions manufactured by the Good Roads Machinery Co. and the pull plows were Climaxes, also manufactured by the Good Roads Machinery Co.

The snow began to fall late Saturday night. By four Sunday morning the Street Cleaning Department call went out to its forces to be in readiness. At 5:03 the 14-14 fire call was sent through to all the fire stations where the equipment was located throughout Manhattan and within two hours, or by seven o'clock, the total force was at work, with the exception of the contractors' forces.

There were 951 miles of streets sched-

uled to be cleared. Within two hours after the forces got to work these streets were passable for traffic. By the time the storm ended, the whole area was cleaned of snow sufficiently to prevent any interference with traffic. Under the original plan the plows were to operate in teams of two and to clean a width of 20 ft. of roadway for a distance of three linear miles in one hour. Owing to the heavy snowfall this could not be perfectly adhered to. Instead, the area to be covered was reduced in many cases to 2 miles. In other cases the plows were split up and worked singly over shorter distances.

Department carts and laborers started immediately sewerage and carting away the snow. By 7 o'clock Sunday morning there were 11,000 laborers and 850 contractors' carts on this work and by Tuesday night many of the tractors had been put to work sewerage also.

Although working under the most difficult of tests, the city's plan succeeded, the organization functioned practically to perfection and there was no serious traffic tie-up. It is estimated that, for this reason, equipment recently purchased by the city with an appropriation of \$4,250,000 has more than paid for itself in this one storm in the saving to the city. The estimated cost of snow removal in this campaign is \$1,000,000 and there was practically no loss to the city's business. Last year the estimated cost of snow removal was nearer \$10,000,000 and the traffic tie-up was estimated to have cost the city about \$60,000,000.

Sell Him a Truck Body Too

If You Sell a Man a Truck Chassis, Only Part of Your Work Is Done. The Truck Dealer Should Know as Much About Bodies as He Does About Trucks and Thereby Make Complete Sales

By B. M. IKERT

MANY automotive dealers who sell motor trucks sell only half of the proposition. They seem satisfied to sell a man or company one or more trucks and then let the purchasers worry about one of the most essential things—the truck body.

The exclusive power-farming dealer soon found out that to sell a farmer a tractor without the implements was to sell him only part of the proposition. He found that in the sales of equipment for the tractor there lay a good source of profit, and like the power farming dealer the truck dealer must learn that with the sale of the truck chassis his work and resultant source of profit has but begun. Like the implement drawn by the farm tractor, the truck body is the business end of the proposition.

Nobody buys a truck for the purpose of parading around with the bare chassis. A truck must be fitted with a body to make it useful for whatever kind of work it is intended to do. If a coal dealer buys a truck it is a pretty safe gamble that he wants to haul coal and must have a suitable body for it. If a farmer buys a truck he will want a body that readily can be converted to suit the various needs of a farm, and so on.

One of the first things the truck dealer must do is find out from an analysis of his territory the potential market for the truck he is selling. But he even can

go further than this. He can with some effort, come pretty close to telling what kinds of bodies are needed for these trucks and, therefore, be prepared to sell them when the time comes. Lack of the right kind of information on the part of some dealers has been responsible for the loss of many a truck sale.

Trucks are vastly harder to sell than passenger cars, because in the latter case the customer rarely has to buy the body separate from the chassis. When it comes to selling trucks for general delivery purposes like wholesale grocery houses, packing houses, etc., the average truck dealer probably is pretty well informed, but in some of the other fields like the contracting business, road work, etc., he does not always cash in on potential business.

There is much to be said these days about combination bodies for trucks and in some cases four types of bodies are afforded at the price of one. Moreover, such bodies more nearly meet the requirements of the general contractor and trucking companies.

In order to better acquaint the dealer with what the market affords in the way of truck bodies—those of the dumping kind—we present on these pages a few illustrations and text matter relative to

bodies made by a concern which has had many years' experience in steel body manufacture.

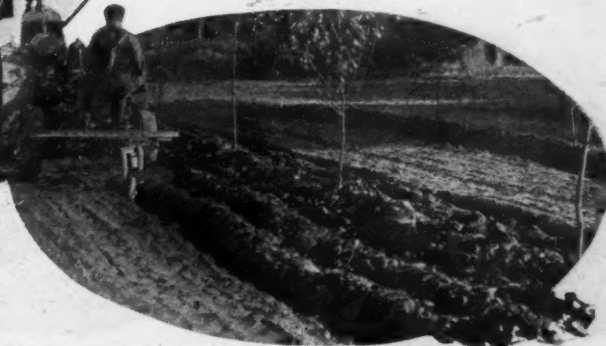
The body shown at the top of page (2) is called a four-in-one body and is fitted with two sets of removable sides, double acting tail gate and manual tail gate control. The sides and tail gate are fitted with a hinged door with a 6-in. spillway built to take a standard coal bag. A special locking device keeps the door closed; when opened it swings outward. By removing pins in the upper hinge bearing the tail gate the gate will fold down the same as an express tail gate. Guide irons on the sides keep the tail gate tightly closed thus allowing no sand, gravel, etc., to leak out. An additional feature of construction is the reinforcing plate at the bottom of the body which strengthens the tail gate and sides and also serves as a bumper to protect the operating device hook. This body is especially adapted to haul such material as coal, ashes, quicklime, coke and other materials.

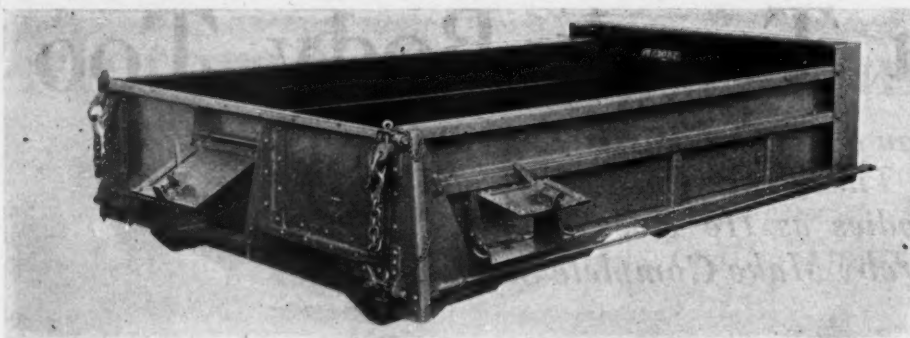
Below the body mentioned above is a type of body known as the two-in-one. This has both sets of sides removed, making it a platform body. Having a double acting tail gate, it renders two distinct services. First, by suspending the tail gate level with the floor the loading space is increased and lengthy materials such as lumber, pipe, beams, etc., can be hauled. Second, by raising or closing the gate, crates, tile, brick, masonry and cement blocks can be hauled. The platform is fitted with malleable stake pockets into which the stake heads fit. Wood sides or racks can be attached and the front and rear are high enough to take sides to give coal capacity.

Still another body shown on these pages is fitted with one set of sides which gives the required capacity for gravel, crushed stone or sand. It affords the same service as the standard gravel

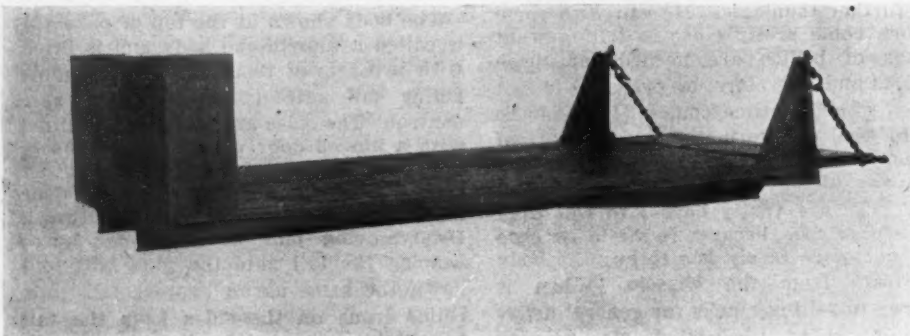


The truck shown in this illustration could not carry its load without a body any more than the tractor shown at the right could do a job of plowing without the plow. The body of a truck is the business end of the proposition and the truck dealer of the future must know as much about bodies as he does about his trucks

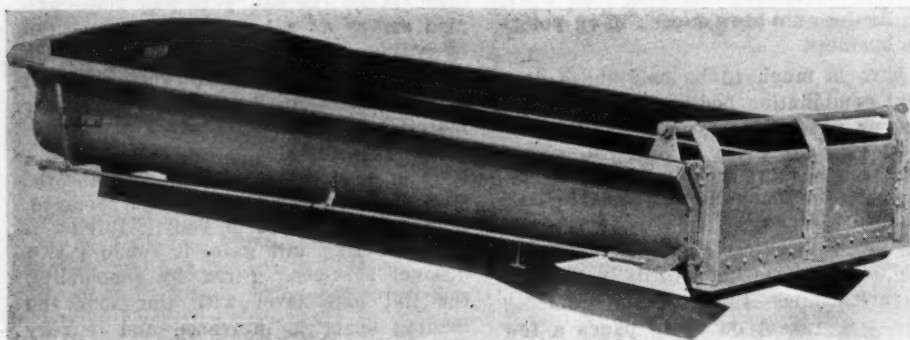




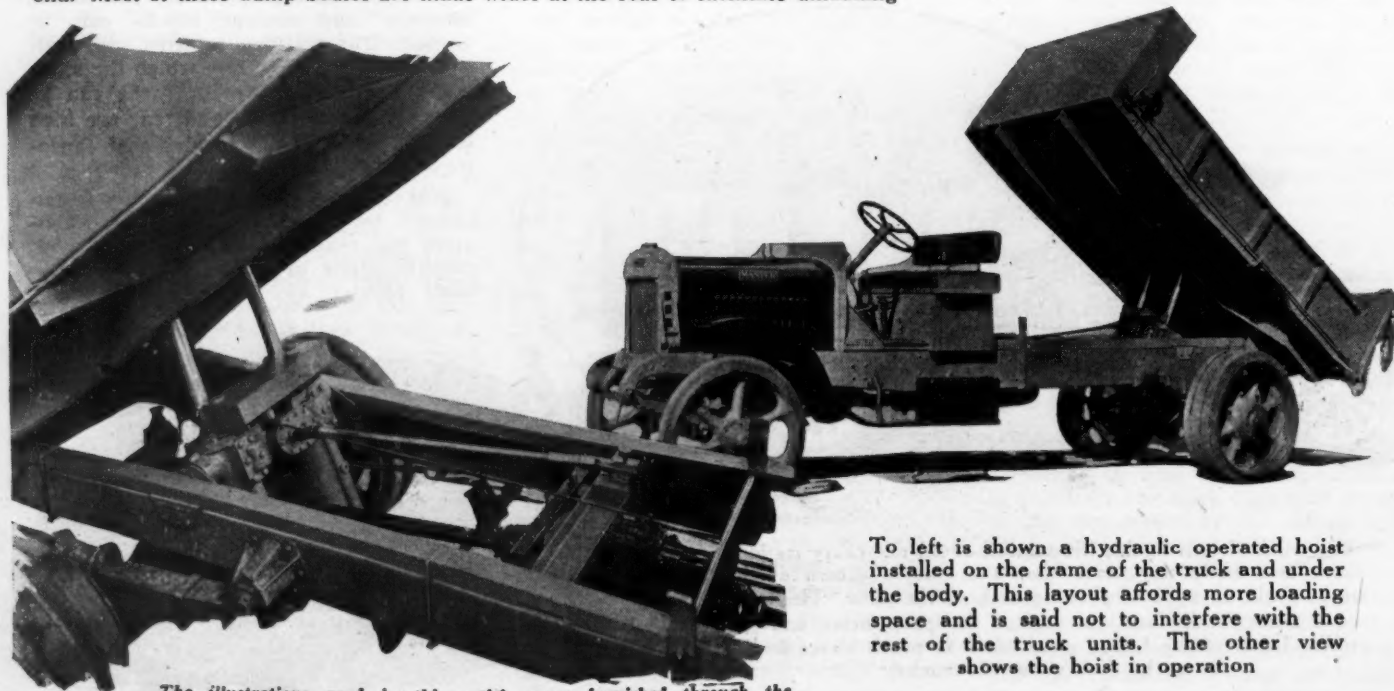
This body is especially adapted for handling coal, ashes, quicklime, coke and other bulk material. Here the body is shown fitted with hinged coal doors



Here is a combination body with the tail gate lowered for pipe, beams and lumber. By lowering the tail gate the loading space is increased and length materials can be handled



Another style of truck body with a round floor, flared sides and crowned front end. Most of these dump bodies are made wider at the rear to facilitate unloading



To left is shown a hydraulic operated hoist installed on the frame of the truck and under the body. This layout affords more loading space and is said not to interfere with the rest of the truck units. The other view shows the hoist in operation

The illustrations used in this article were furnished through the courtesy of The Heil Co., Milwaukee, Wis.

body. The sides can be taken off by removing four bolts.

Standard dump bodies are regularly furnished with single-acting tail gate. They are built for all makes of trucks, the standard widths being 4 ft. 6 in. to 6 ft. and lengths, 9 ft. to 12 ft. in 6-in. intervals. All bodies are 3 in. wider at the rear to allow the loads to dump easily.

The asphalt body shown is made with an outer shell, a thick layer of asbestos and an inner shell of steel. Two steps are placed at the sides to enable the driver to scrape out any asphalt that may stick to the body. The capacities of these bodies range from 70 to 160 cu. ft. The bodies also are made 3 in. higher than the required capacity to prevent any of the materials carried splashing over the top.

Accessories for Truck Bodies

It is possible to get certain kinds of body accessories to go with this line of truck bodies, such as fenders, swinging partitions, wearing plates, etc. The mud guards extend either three-quarters or full length of the body. They are built wide enough to extend over the wheels and prevent mud or water from splashing on the body. They also serve as steps.

Swinging partitions make it possible to haul several kinds of building material or coal or several orders of each. Two hook levers keep the partitions in place. The partitions fall back into place of their own weight when the compartments are emptied. Wearing plates are placed on the bottom of the dump bodies to protect them when they receive rough usage. When loading is done by a steam shovel the material often is dropped from a considerable height and in this case the wearing plates add materially to the life of the body.

A hydraulic type of hoist is shown in connection with the bodies on these pages. The hoist is mounted on the frame of the truck just in front of the rear axle. Power is taken from the front

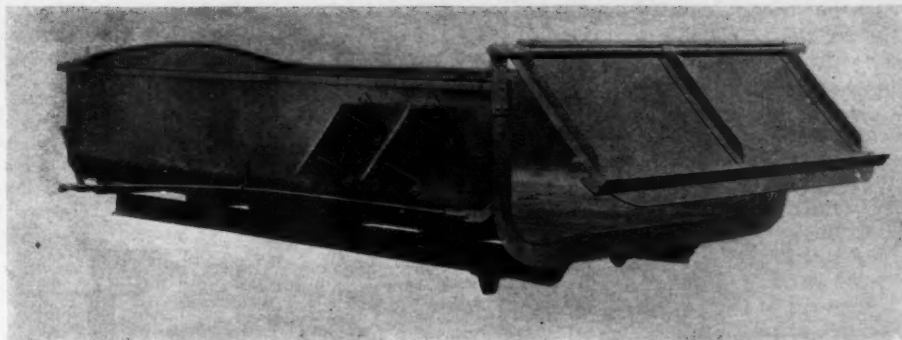
propeller shaft or transmission amidship and is applied directly to the pump drive by means of a shaft and universal joints. Some of the features claimed for this hoist are accessibility and the increased loading space made possible by locating the hoist under the body. The body can be placed just back of the cab, thus giving proper load distribution and making possible the use of a body with lower sides for a given capacity. This gives a lower shoveling height.

In ordering any kind of a truck body a dealer must make mention of the make and model truck, wheelbase and capacity in tons, model of body desired, accessories desired, material to be hauled, etc.

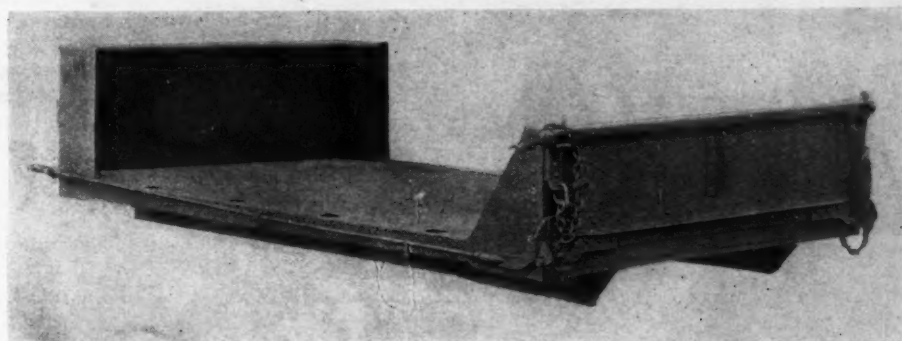
Must Know Needs of Farmer

In addition to informing himself on the line of convertible line of truck bodies shown herewith the truck dealer of the future must know all there is to know about bodies that can be adapted to the farmer's use. The dealer must make an analysis of the farming situation in the territory in which he lives, if such is the case, as to the kind of crops raised, distances to be traversed, etc. All this will be of value when it comes to selling the farmer a truck. In the past too many sales have been made without the proper analyses having first been made and the result has been that the farmer has had forced upon him a truck for which he has but little actual need.

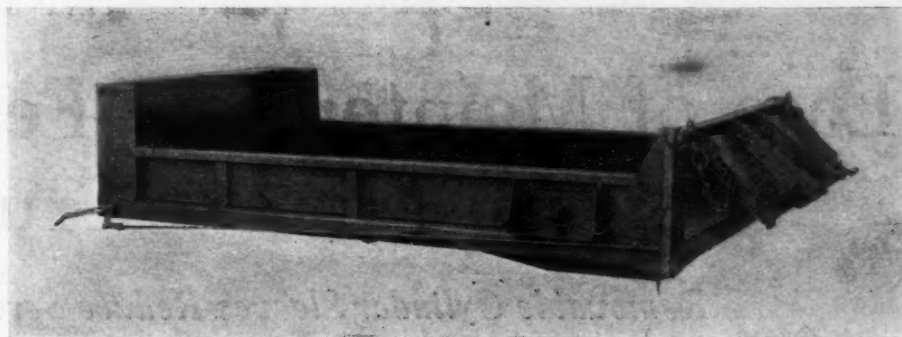
The next few years will no doubt see a lot of road building going on in all sections of the country and this means that there will be sales of trucks fitted with bodies especially suited to road building work. Here again the dealer can take the bull by the horns and fortify himself with the information about truck bodies for contractors and builders in general. Most of the truck body builders are prepared to send the dealer blue prints, catalogs, etc., of their line and there is little excuse these days for the truck dealer not being informed on this profitable line of business.



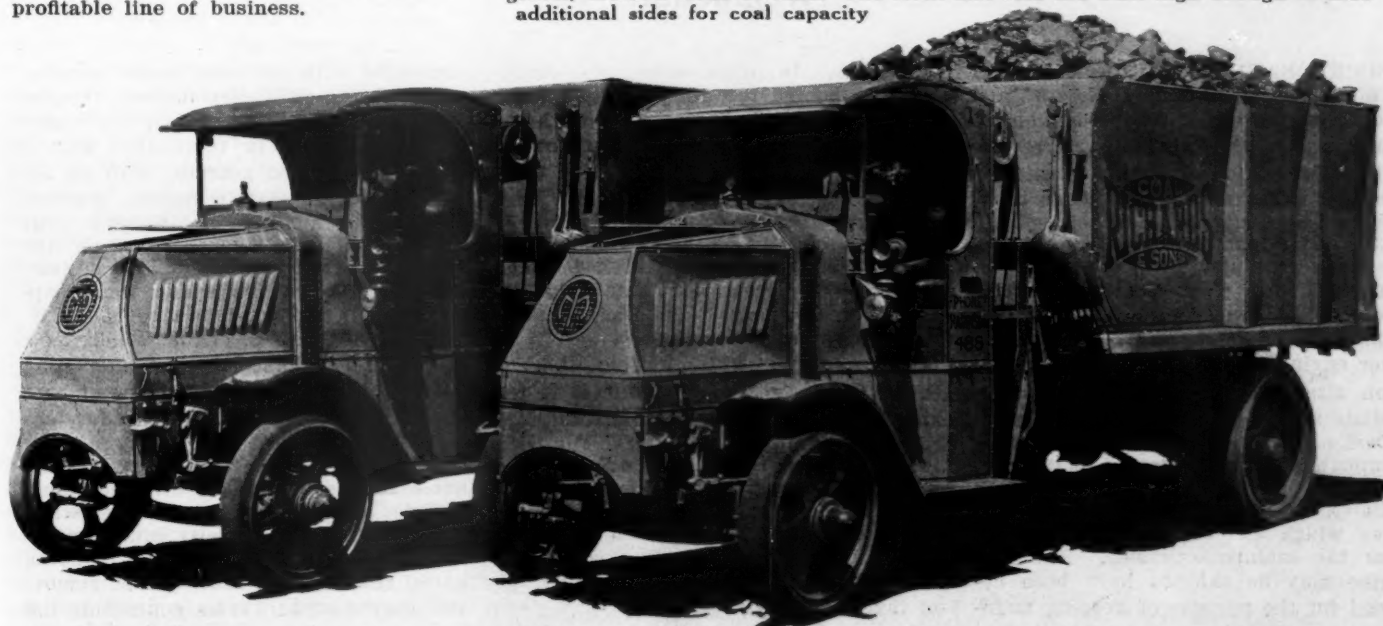
This shows an asphalt body. It is made with an outer shell and inner shell of steel, the two being separated by a thick layer of asbestos



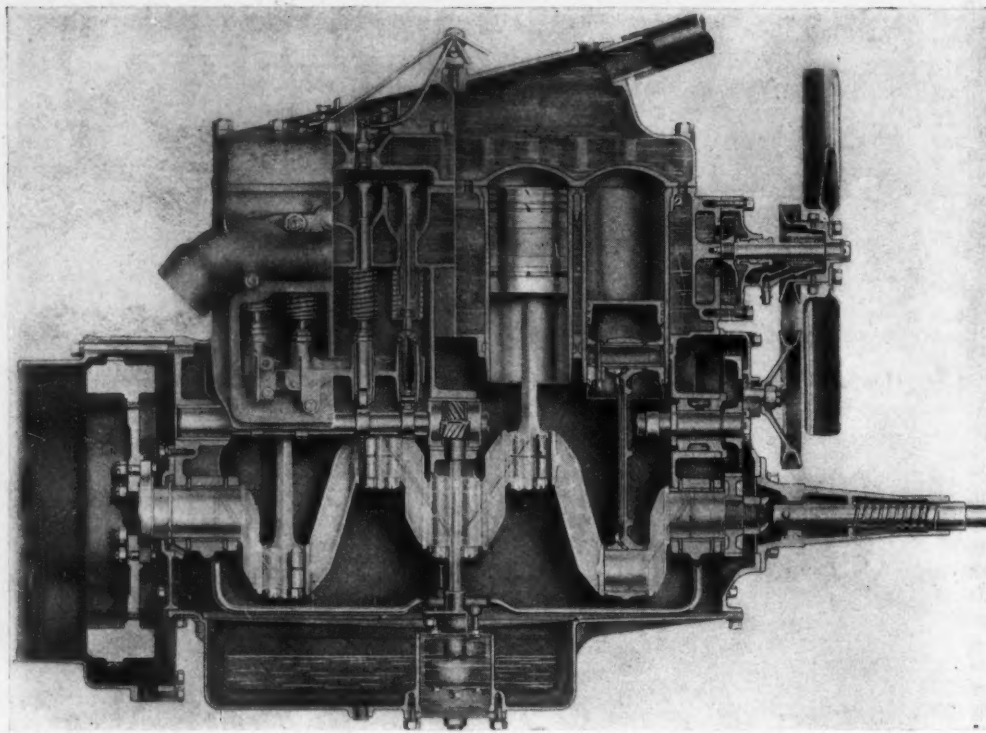
Here is shown the two-in-one truck body with the tail gate raised. The stake pockets shown in the floor allow with use of stakes, the carrying of boxes, etc.



This body is fitted with one set of sides which gives the required capacity for gravel, crushed stone or sand. The front and rear are built high enough to take additional sides for coal capacity



Often truck bodies run into massive sizes. Here are two truck bodies built for $7\frac{1}{2}$ ton Mack trucks. They have a capacity of 325 cu. ft. and between the two trucks they are hauling eleven tons of coal



Sectional view of new engine for General Motors truck line. Note detachable cylinder sleeves, excess amount of water in circulating system and pressure feed oiling. The cylinder block of this engine is so designed that all moving parts bear on replaceable members. Thus the block becomes merely a retainer for all the wearing parts

Service Features

THE big features of the new General Motors truck engines that are noteworthy from a service standpoint are:

The cylinder sleeves are replaceable. One may be replaced, in case of scoring, in the short space of four hours.

The oil pump is contained in its individual compartment and may be cleaned without draining the oil from the engine.

No moving parts are in contact with the engine block. Every part that wears is replaceable and may be removed independently.

Cooling is by both thermosyphon and pump circulation.

Tappet bracket holding tappets for each two cylinders is removable.

Ease of Maintenance Features New General Motors Truck Line

Removable Cylinder Sleeves Reduce Service Costs and Minimize Time of Lay-up for Repairs—Valve Assembly Removable

INCORPORATING an engine of its own manufacture, the General Motors Truck Co., is just entering production on a new line of trucks which is a revised and refined edition of the line previously marketed. The new line is made up of five models, the capacities being $\frac{3}{4}$, 1, 2, $3\frac{1}{2}$ and 5-ton. Three engines, all of similar design and all products of the General Motors plant, take care of this line of five trucks, the same engine being used in the $\frac{3}{4}$ and 1-ton, and another engine taking care of the $3\frac{1}{2}$ and 5-ton sizes. The 2-ton uses an intermediate size.

Designed with an idea of furnishing uninterrupted transportation to the purchaser of the truck, the General Motors vehicles incorporate a great many features which are of particular interest from the maintenance side. The new engine may be said to have been designed for the purpose of keeping maintenance cost as low as possible and to keep the truck tied up for as short a time as possible when repairs do become

necessary. In other words, the fundamentals behind the design of this truck engine are closely wrapped up with the thought that the cost to the truck owner of having his vehicle laid up for a week or two may be much more serious than the actual charges for the repair bill and, consequently, as the description will bring out, this engine has been designed very largely from the standpoint of facilitating repairs and adjustments when they become necessary.

As compared with the old line of G. M. C. trucks, the new line is faster and more powerful. Heretofore, the design has been principally laid out with the idea of supplying sufficient power for all circumstances. In addition, the speed factor has been incorporated in the present models with the idea that the present road and transportation conditions make the factor of speed as important as that of power.

By improvements in the design of the engine, considerable more power, or, more exactly, torque has been secured as

compared with the older model engines, although the cubic displacement remains about the same. The engines are higher speed, and this, in connection with a specially designed gearbox, with an additional countershaft reduction, provides double the number of available gear ratios and, consequently, widens the range of performance and give a flexibility to the vehicle which was unapproached in the previous models.

The new G. M. C. engine which, as a design proposition, makes an interesting study, both from the standpoint of ease of maintenance and of power development, incorporates some new features as far as truck engines are concerned. Some of these features are removable cylinder sleeves, force feed lubrication, super-heated high velocity intake manifold, interchangeability of all wearing parts, removable cylinder heads, removable engine support arms, connecting rod bearings cast integral with the connecting rods, combination thermosyphon and pump cooling system, removable valve

assembly and non-scoring piston pins. These points indicate in a number of instances a study of reduction in maintenance time.

Probably the most interesting feature of the engine is the removable cylinder sleeve. These sleeves are gray iron castings, machined inside and outside to very close limits. In manufacture, they are first cut off, then rough machined all over on the outside and inside. After a period of aging, the bore and the outside are finished. The advantages claimed for this type of construction are: first, interchangeability, second, ease of replacement and third, elimination of misalignment of the cylinders because of shifting of cores in casting. From the maintenance standpoint, which is pre-eminent throughout the design of this engine, should a cylinder wall be scored through lack of lubrication or any other cause so as to necessitate replacement, it is possible to make such replacement in four hours, as compared with ten days to two weeks tie-up with the ordinary regrinding methods. Not only does this provide a saving in service cost, but also a reduction in the lay-up time of the truck.

WET SLEEVE CONSTRUCTION GIVES INCREASED COOLING CAPACITY

From an operating standpoint, both the piston and cylinder, being cylindrical in form, give uniform expansion, thus obviating the possibility of blow-bys or compression leaks through the irregular expansion of the cylinder wall. Since the sleeve comes in direct contact with the water, this being a true, wet sleeve construction, a greatly increased volume of water is possible in the cooling system; in fact, a tremendous gain in the volume of water in the system at one time has been affected by this construction.

The sleeves have been designed with an eye toward the positive prevention of water leaks. The sleeves are longer than the total length and throw of the piston and the exterior of the sleeve is machined to extremely close limits affording a seat for the gaskets. The top gasket is asbestos placed immediately under the flanged portion of the sleeve, while the lower gasket is of compressed cork placed in a recess in the cylinder casting. The cork gasket is compressed when the sleeve is inserted, the lower end of the sleeve being slightly tapered. This method, since the sleeve is a press fit, is claimed to successfully accomplish a perfectly water tight contact of sleeve to the cylinder block. After the sleeve is inserted and sealed, it is held in place rigidly by the cylinder head which is bolted down with twenty-four 5/8 in. studs.

The replacement of these sleeves becomes an easy matter with a special tool which resembles very closely a wheel puller used to withdraw them from the block should it become necessary. By means of this tool and by following instructions issued by the makers, it is possible to make the replacement in four hours as indicated, which is a tremendous

step in cutting down maintenance time on truck engines as far as cylinder regrinding is concerned.

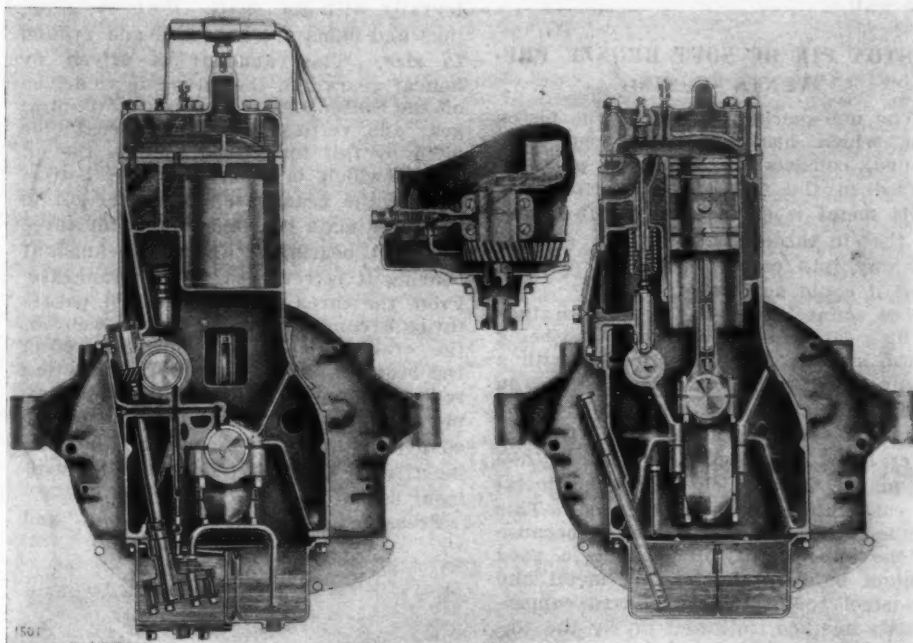
The separate cylinder head casting is of semi-steel and is readily removable for access to the combustion chamber, valves and piston heads. The heads are made large so as to provide a large body of water over the valves and combustion chamber.

The cylinder block and crankcase are cast in units of semi-steel and the block has a feature in that there are no wearing parts attached to it or part of it which are not replaceable, with the single exception of the valve seats. These are provided, however, with sufficient metal for reseating the valves many times in excess of their requirements during the life of the engine. The valve seats are cast integrally with the block and in the casting, the excess metal for reseating the valves is allowed.

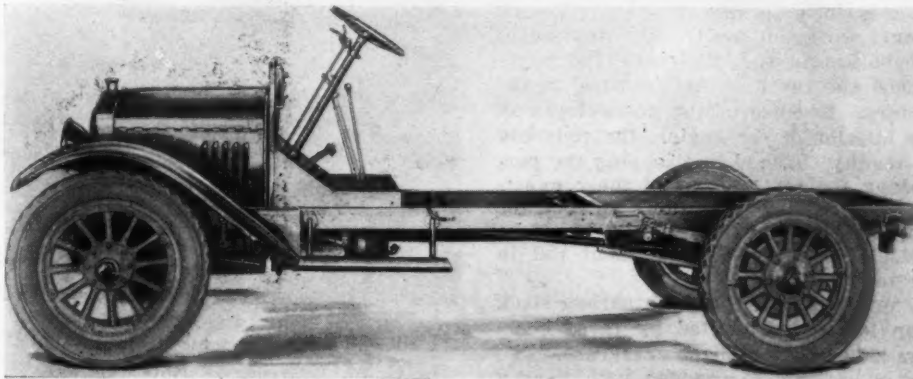
The engine is suspended on the three-point principle, ball and socket mountings being employed in the two rear supports. This mounting is in conjunction

with the semi-flexible frame construction. The ball and socket joint is held together by a bolt that passes through the joint and extends below the engine hanger far enough to enable the mounting of the heavy coil spring. In addition to the three-point suspension, this method permits of yielding in the event of excessive distortion of the frame. It also is designed to compensate for any wear that might take place in the joint, as the spring provides an automatic take-up. The front support of the engine, which forms the third point, is a collar on the starting crank housing which is bolted to the timing gear cover. This suspension point is also protected by the spring and clamp method to compensate for disalignment.

The pistons are gray iron, made of the same metal as the removable sleeve, so that the expansion rates are equal. There are four piston rings, three above the piston pin and one in the piston skirt below the pin. Grooves are cut in the piston face immediately below each of the two lower rings. Holes are drilled from the bottom of these grooves to the



Transverse sectional views of new G. M. C. truck engine, with detail of oil relief valves. It can be seen in this illustration that the oil pump is contained in a compartment of its own, making it possible to clean the pump without draining the oil from the engine



One of the smaller units of the complete new G.M.C. truck line, model K-16, 1-ton capacity

Specifications of G. M. C. Series K. Trucks

	K-15	K-16	K-41	K-71	K-101
Tons capacity.....	$\frac{3}{4}$	1	2	$3\frac{1}{2}$	5
Wheelbase, inches...	132	132	146	163	163
			158	187	187
Tires	Pnu.	Pnu.	Sol.	Sol.	Sol.
Tire size, front.....	33x4 $\frac{1}{2}$	34x5	36x4	36x5	36x6
Tire size, rear.....	33x4 $\frac{1}{2}$	34x5	36x7	40x5 Du.	40x6 Du.
No. Cyl., bore, stroke	4-3 $\frac{1}{2}$ x5 $\frac{1}{2}$	4-3 $\frac{1}{2}$ x5 $\frac{1}{2}$	4-4x4 $\frac{1}{2}$	4x4 $\frac{1}{2}$ x6	4-4 $\frac{1}{2}$ x6
Ignition	Eisman	Eismn	Eismn	Eismn	Eismn
Type Electric System	None	Lighting	Lighting	Lighting	Lighting
Carbureter make....	Marvel	Marvel	Marvel	Marvel	Marvel
Fuel feed	Grv.	Grv.	Grv.	Grv.	Grv.
Final drive type....	Bevel	Bevel	Worm	Worm	Worm

interior of the piston, providing a passage for surplus oil. The rings are plain, diagonally split type, except the second ring from the bottom, which is an expansion ring with an over-lapping joint and it is constructed so that the pressure between the two pieces keeps the ring tight in the groove and also against the wall.

PISTON PIN OF SOFT BRONZE PREVENTS SCORING

The non-scoring feature of the piston pin, which has previously been mentioned, consists of a bronze plug inserted in the end of each piston pin. This metal is exceptionally soft bronze so that in the event of the pin working its way into contact with the cylinder wall it could not score it.

The connecting rods are drop forgings of high carbon steel, the upper end being bored and reamed and provided with a bronze bushing forming the bearing on the piston pin. The lower end of the rod and cap are electro copper-plated after being machined. The end is then tin plated, after which the bearing metal is cast integrally with the rod. This method of construction is used because of the impossibility of securing a good contact between the bearing metal and the steel rods. By the electro copper-plating method, followed up by the tinning process, it has been found possible to get a very intimate metal contact which will not permit the babbitt to pound out.

As a service feature, this method of babbitting the rod has been found advantageous in passenger car practice and should work out for trucks. Instead of rebabbitting a rod, the entire rod is replaced and the used rod returned to the factory. Because of the accessibility of the interior of the engine, the rods can be readily changed by dropping the pan, making the replacement of the connecting rods an easy operation. In fact, for long distance transportation, it would be feasible to carry a replacement rod in the tool box.

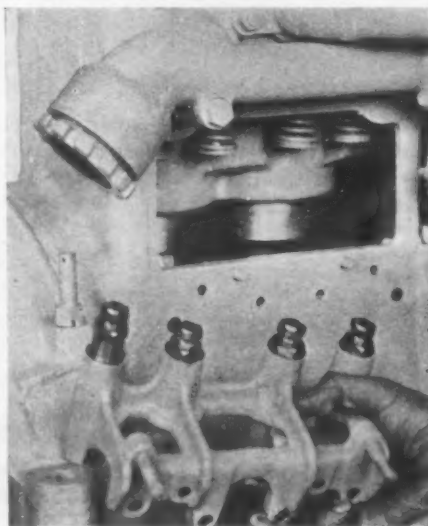
The crankshaft is a high carbon steel, drop forging, supported by three bearings held by webs in the crankcase. The center bearing is provided with flanges to take the end thrust.

The flywheel is semi-steel, machined

all over and balanced, and is attached to the flange of the crankshaft by six alloy steel bolts. The starter teeth are cut integrally on the flywheels of all engines and electric starting can be provided on any of the models.

The camshaft is drop forged of high carbon steel, the cams being forged integrally with the shaft. Both the bearings and cams are hardened and ground to size. The camshaft is driven by helical gears and the oil pump is driven off the center of the camshaft by a spiral gear and vertical shaft. The engine is oiled by full force feed system, the oil pump, which is located in the bottom half of the crankcase, forces the oil to the three main bearings and to the three camshaft bearings. From the camshaft bearing it is returned to the crankcase. From the three main bearings it passes through conduits drilled in the webs of the crankshaft to the four connecting rod bearings. From the four connecting rod bearings it is forced through copper conduits secured in the side of the connecting rods to the piston pin bearings, from where it returns to the sediment basin.

Pressure is regulated by ball and



Unit valve lifter assembly employed in G. M. C. trucks. Note the exposure to the crankcase oil spray allowing parts to run in bath of oil

spring by-pass valve. The capacity of the pump is such that there is a surplus of oil at all times. This surplus passes through the by-pass valve and is discharged directly on the timing gears. The oil, which is forced out of the ends of the main bearings and connecting rod bearings is thrown out as spray and is discharged directly on the timing gears. The oil which is forced out of the ends of the main bearings and connecting rod bearings is thrown out as spray and lubricates the cylinder walls and valve lifter assemblies.

The oil pump is hung in the crankcase on a bracket to which it is securely fastened. It is of the gear type and driven by the splined vertical shaft which is driven off the camshaft. The oil pan, which is an aluminum casting, is an interesting construction incorporating sediment chambers through which the oil must pass before it ever returns to the pump intake. The first settling chamber is under and surrounding the pump, although it is separate from the intake. The major portion of the dirt or sediment contained in the oil is deposited in this chamber before the oil passes to the last settling chamber and it is possible to readily drain this by the removal of a plug beneath the pump. The first settling chamber has a capacity of about 1 pt., so that this is all the oil that is lost in cleaning the oil pan, as compared with other methods where it is necessary to drain off the entire supply.

WATER CIRCULATED BY THERMO-SYPHON AND PUMP

An interesting feature is incorporated in the cooling system in that the water is circulated both by thermo-syphon and pump. The water in the cylinder head and around the valves is circulated by the pump. The water contained in the jackets around the cylinder sleeve is not affected by the pump, but circulates by thermo-syphon. Thus, the water around the jacket does not circulate until it is heated sufficiently to set up a thermo-syphon action.

The water pump is of centrifugal type, the impeller being mounted on the inner end of the same shaft as the fan, the housing in which it works being a recess, cast integrally with the cylinder block. The shaft rotates on a Hyatt roller bearing, and is lubricated by an Alemite connection.

The radiators are vertical fin and tube type, the tubes being assembled in connection with the cooling fins in a single unit or core. This construction is used on the two lighter models known as K-15 and K-16 of $\frac{3}{4}$ and 1-ton capacity respectively. On the larger types; that is, the two $3\frac{1}{2}$ and 5-ton sizes known as models K-41, K-71 and K-101, the radiators are of the vertical continuous fin and tube, built-up type, the assembly consisting of a core which is detachable as a unit, two side members, so designed as to protect the core and top and bottom members in the form of tanks, which insure even distribution of the water throughout the entire surface and content of the core.

To take care of present gasoline conditions, a combination manifold and carbureter has been worked out. Both the vertical section of the intake manifold and the venturi chamber of the carbureter are super-heated by exhaust gases direct from the exhaust manifold. Dampers are provided to take care of the regulation of the supply of heat and for very hot climates a gasket can be inserted which cuts out the exhaust jacketing altogether, eliminating the hot-spot and permitting operation at atmospheric temperature. The carbureter is the Marvel.

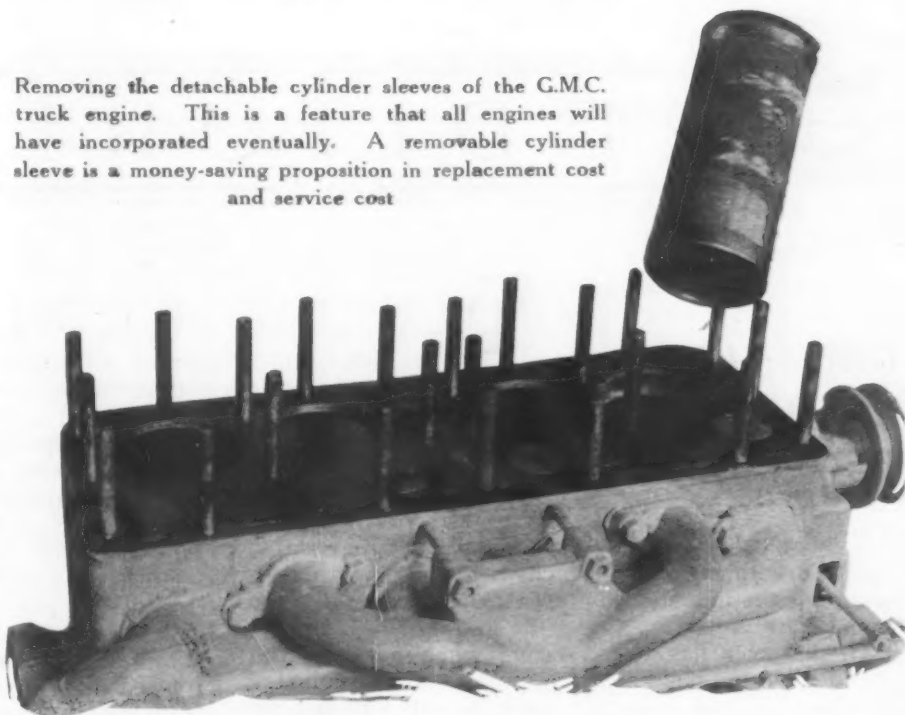
ELECTRICAL EQUIPMENT RUGGED FOR TRUCK WORK

The governor is a G. M. C. design and is of the flyball type. It consists of four steel balls, held in a steel pressing containing four separate grooves which act both as ball retainers and channels in which the balls travel. As the channels are set at approximately 45 deg. angle to the shaft of the governor, the balls travel both outward and forward through the increasing centrifugal force. The steel balls contact with a flat steel disc, which is mounted on a bronze bushing, and as the balls are thrown outward and forward, the disc is pressed forward. This disc contacts with a ball thrust bearing and through this bearing connects with the governor butterfly control lever on the carbureter. Since the governor is mounted directly in circuit with the lubricating system. It is thoroughly taken care of by the oil which is discharged on the timing gears, so that it is at all times working in an oil bath.

Ignition is supplied by an Eisemann magneto which is mounted on the generator side of the engine and driven through a coupling by the armature shaft of the generator. On all but the smallest model, the Eisemann impulse coupling is fitted. The electric generator is of G. M. C. design, manufactured by Remy. It has been designed exclusively for truck use, being rugged to withstand pounding and hard service. The front end of the generator is cylindrical in shape and is machined to fit an opening in the portion of the timing gear housing that is integral with the cylinder block. The driving gear is mounted on the end of the armature shaft and meshes directly with one of the timing gears. This same shaft then projects through the front end of the timing gear housing and carries the pulley which drives the pump and the fan. The generator is fitted with thermostat control and third brush regulation. The thermostat control automatically varies the amount of current delivered to the battery by the generator. In cold weather it steps up the current and in warm weather decreases it.

One of the features of the electrical system is the fact that the wiring assembly is a complete unit in itself and is made up to give exceptional simplicity. All the instruments, except those on the smallest model which have formerly been mounted directly on the dash, are now assembled in a single unit in the form of an aluminum housing. A panel

Removing the detachable cylinder sleeves of the G.M.C. truck engine. This is a feature that all engines will have incorporated eventually. A removable cylinder sleeve is a money-saving proposition in replacement cost and service cost

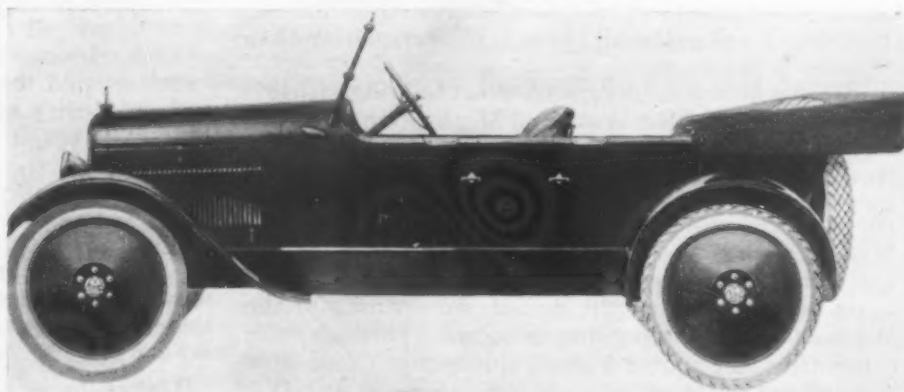


on this housing can be lowered to provide access to the switch connections and terminals. No electric lights are furnished on K-15, which is the smallest model. The other four, however, are provided with two electric headlights and one tail light.

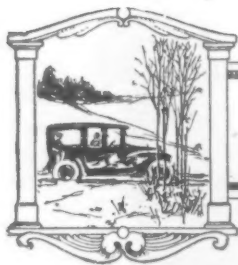
No material changes have been made in the clutch for this year, the clutch being a multiple dry disk type with eleven disks in the two smaller models; thirteen in the 2-ton and seventeen in 3½ and 5-ton. The transmission, however, is of exceptional interest in that it provides two speed ranges, due to two sets of constant mesh gears, either one of which can be thrown into engagement, proving a separate speed range. Each

speed range has four separate gear ratios so that the operator has a choice of eight forward and two reverse speeds. The addition of only four parts to the gearbox has provided this double range. This double range transmission has permitted of a higher geared rear axle, thus promoting economy and, at the same time, because of the double range of speed in the gearset, it is possible to secure a lower gear ratio than before. It has been estimated that as compared with the previous model, the pulling power of the truck has been increased 30 per cent and the economy by the same percentage. A third lever is fitted to take care of the shift into either of the transmission speed ranges.

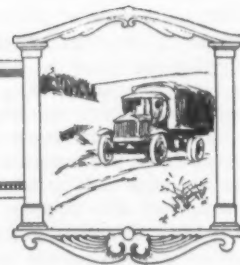
Elgin Announces New Models



The new series K-1 Elgin Six for 1921, embody a number of improvements and refinements. Special design French side lights are mounted on the cowl of open models with the unique arrangement whereby the light shows through the lense in an outline of the Elgin trade mark. Dull leather door pads, mahogany dash board and tonneau panel with tonneau light are new refinements. For the convenience of the driver the new aluminum steering column support has been made adjustable. The column can be placed at the angle most suitable for the driver. The sedan is equipped with mahogany vanity case and smoking set



EDITORIAL



ORGANIZED EFFORT FOR PROTECTION

THE automobile industry is facing a serious situation without seeming to realize it or, at least, without taking a positive and determined step toward adopting a program that can meet it. There seems to be an unfortunate and regrettable lack of organizing effort which will bring together all factors of the industry to present to national and state law makers the viewpoint of the automobile industry.

There never has been a time when national and state legislation has been so important to the industry as now. MOTOR AGE last week briefly outlined the situation in Washington where Congress is in the mood to pass a revenue bill which will contain sections—if the recommendations of Secretary Houston are allowed to stand—that plainly are unjust, unfair and discriminatory toward the industry. It is not beyond the realm of possibility that state legislatures will enact legislation that will further impose overburdening taxes on an industry, the second in the country, and that is already overburdened with taxation.

Leaders in Congress look at the automobile as a luxury and as such are going to tax it. In seeking a readjustment of a tax schedule, the industry should seek no favors but it should ask that it no longer be treated as the football of politics and taxation.

Senator Harding will be inaugurated on March 4; ten days later the extraordinary session of Congress probably will convene; and within a month the House Ways and Means Committee will open its hearings on Federal taxation. That leaves to the industry less than two months in which to formulate a platform upon which every organization interested in automotive vehicles can stand. There is neither platform nor definite program now.

There is lack of an organized effort to bring strongly to the attention of the Ways and Means Committee the viewpoint of the automobile industry. The National Automobile Chamber of Commerce is not exerting all its great influence to act in harmony with other organizations; the directors of the Motor and Accessory Manufacturers' Association adjourned their last meeting with the tax question tabled and will not convene again until almost on the eve of the opening of the Ways and Means Committee hearings. Through state committees, the Motor Vehicle Conference Committee is watching the work of state legislatures.

The time to act is not four months away—nor two months—nor one month. Unless every factor in the industry elects to get together and act together in attacking legislation that is manifestly unfair to the industry a morning will come one of these fine days when dealers will want to know what has happened to the recovery of business which had been going on at an encouraging rate.

The industry has as yet taken no determined stand to prevent the flooding of the country with automotive equipment made in America but bought for almost nothing in the countries to which it was sold nor has it exerted itself to stop the wholesale dumping of automotive vehicles of all kinds on the market. Is there harmony lacking somewhere?

A hit or miss fight, or a helter-skelter battle is not likely to produce the same result that organized effort can accomplish. But if a legislator hears from his constituents—members of every automotive association—to the effect that classing the automobile as a luxury is not in keeping with the times he would know that they would hold him accountable for any taxes imposed upon it as such.

Organized effort is what is needed and it is needed badly if the industry is not to experience again the slackness which attended it during the past few months.



REMOVABLE CYLINDER SLEEVES

ONE of the very interesting developments being noted in all new designs these days is the application of removable cylinder sleeves.

This week we devote considerable space to a description of the new line of trucks produced by the General Motors Corp. In these trucks there is much thought given the subject of maintenance and removable cylinder sleeves is one of the items that will reduce the service cost on these trucks.

It is interesting to note the savings when removable cylinder sleeves are used. A new cylinder block for a certain sized engine may be had for \$150. If one cylinder becomes scored from a loose wrist pin, so much so that the score mark can not be ground out, or welded with any degree of permanency, a new block is necessary, but if the engine was fitted with removable sleeves, the cost of one sleeve would be about \$15. The amount of work necessary to replace a whole block as compared with a removable sleeve is also a factor worthy of consideration. The service charge is a labor item primarily. The time necessary to remove and replace a cylinder block is vastly greater than that necessary to merely remove and replace a cylinder sleeve.

Trucks to be used for long distance hauls might conveniently carry a spare cylinder sleeve for emergency cases where a wrist pin perhaps has worked loose and done irreparable damage. One could go on and expand on the manifold benefits from engine construction of this kind but it is needless to do so. The time is not very far distant when every truck, every car and every tractor will have to have construction such as this to meet competition.

Charleston, W. Va., in Good Position for Banner Year

Prospects Obtained and Sales Made at Annual Display of Passenger Cars Held There

CHARLESTON, W. VA., Feb. 25—This city with its rapidly growing population of 40,000, located in the most populous county of West Virginia and the center of what within a radius of 100 miles exceeds 300,000 in population, promises well for the sale of automobiles during 1921.

The annual show under the auspices of the Charleston Automobile Club from Feb. 14 to 19 was the finest in the history of the city, attended by more people and attended, too, by more sales and more inquiries.

The industrial depression did not hit this section hard and the automobile business has been fairly good with prospects of a record breaking year ahead. Charleston's industries are diversified. There is much wealth here, scores who have become wealthy in oil and coal development of which this city is the center. Many, too, have become wealthy in lumber development. The war made Charleston a great city. The government built nitro, near here, and while it abandoned the plant, it was taken over by local capitalists, who are selling the buildings to various industries and nitro is taking on a new lease of life. Thousands are employed in the coal and lumber fields of this section.

There are many higher priced cars sold here, though, of course, there are more of the lower priced cars sold. There is, however, the wealth and interest here sufficient to make the handling of the "quality" cars profitable. The show this year was confined wholly to passenger cars. There were 60 cars on exhibition of 37 different makes. The display was in charge of E. B. Hager, secretary of the club. It is estimated over 35,000 people attended the show.

N. A. D. A. Holding Meetings to Form State Associations

New York, Feb. 17—State associations of automobile dealers will be formed soon following work which has been done in those states by P. F. Drury of the National Automobile Dealers' Association. Mr. Drury has just completed a series of meetings in Grand Rapids, Kalamazoo, Jackson, Lansing, Battle Creek and Muskegon, in which cities the dealers are all affiliated with the National Automobile Dealers' Association.

On Feb. 22 Manager Harry G. Moock and Guy C. Simons of the Detroit association will address a joint meeting at Saginaw of the dealers in that city, Flint and Bay City. The following day Mr. Moock will attend a trade conference in Detroit to discuss plans for forming a Michigan association.

Following his tour through Michigan Mr. Drury attended a meeting of dealers

from central Pennsylvania at Harrisburg and arranged for an N. A. D. A. campaign in that state.

Following the Harrisburg meeting he attended a session of the motor vehicle conference at the N. A. C. C. offices in this city. He states that the checking up of results of the annual meeting in Chicago showed that 1,258 delegates registered and that the reduced fare secured to them through their N. A. D. A. membership amounted to \$17,000.

Business Improving—Is Report of Chamber of Commerce

WASHINGTON, Feb. 26—*Business conditions will improve from now on, says Archer Wall Douglas, chairman of the Committee of Statistics and Standards of the Chamber of Commerce of the United States, in his monthly review of business.*

"The most convincing evidence that we are on the high road to recovery," Mr. Douglas says, "is found in the universal report, brought by traveling salesmen from every section of the country, of steadily growing sentiment that business will be better in the spring"—not a sudden return to prosperity, which is neither likely nor desirable, but a slow and natural working out of those processes of liquidation, which are now in full operation.

SUES VICTOR TRUCK

Benton Harbor, Mich., Feb. 21—E. E. Edgar and John S. Watt of Harvey, Ill., have filed suit alleging misrepresentation and fraud against the Victor Truck Co. of St. Joseph, Mich. The suit is said to be the outcome of the failure of the Baroda Commercial Bank a short time ago. One of the principal defendants is A. E. Rick, president of the defunct bank, from whom a full accounting is asked by the plaintiffs. The petition asks the appointment of a receiver and a full accounting from F. D. Allis and C. C. VanWagoner, officials of the truck company.

SHOW BY COUNTY DEALERS

Lincoln, Ill., Feb. 19—The annual motor car show of the Logan County Automobile Dealers' Association will be held here April 21, 22 and 23. The show will be for passenger cars only, about 100 being shown by 25 members of the association. Accessories will also be given prominence in separate booths.

Texas Dealers Know Nothing of Dull Period in Business

Advanced Orders Indicate 1920 Best Year—Most Cars Sell for Cash

DALLAS, TEX., Feb. 26—If there has been any business depression Dallas, and automobile dealers in Texas generally have failed to notice it. If there is to be a dull period in the automobile business in Texas this summer the dealers have received no information of it. Advanced orders indicate a better year than 1920 when a record was hung up in the Lone Star state.

Dealers say they are selling more \$2,000 to \$3,500 cars than they ever sold before. Their advanced orders and their inquiries indicate these priced cars will be the favorite this year. Hudson, Cadillac, Chalmers, Reo, Paige, Franklin and other dealers declare their business for the first six weeks of the year showed a decided increase and that their inquiries indicate this business will continue. Another thing which encourages the Texas dealers is the fact that in most cases cash, or the greater part cash, is being paid for cars. In this manner the dealers are not so badly worried over the fact that loans have been curtailed by the banks to a considerable extent.

Better Business Indicated

The lower priced cars are being sold in amounts which indicate the business in these lines will be better this year than last.

Even the used car dealers in Dallas and other north Texas towns are reporting better business. To quote a half dozen dealers of Dallas "it seems that everyone is going to own his own automobile." They believe high street car fare, connected with the convenience of having a car, has increased the business and demands.

Maker of Starters for Fords Reopens on Five Day Schedule

Detroit, Feb. 25—Liberty Starter Co., which makes the majority of starters for Ford cars and which has been closed more than two months, was reopened yesterday with a few hundred men and the force is being increased steadily until a maximum of 750 will be employed, this total representing about 50 per cent of the normal force. A five day week schedule will prevail at the plant for the present.

"We will ask the men to give us their best efforts and there will be no cut in wage," said President Hartwig. "The five day week plan will be maintained until increased business justifies a full week."

Half of the usual shipments to the Ford Motor Co. were started yesterday. With prospects for a steady increase in Ford production, President Hartwig said, he expected production at his plant to move upward accordingly.

Vast Improvement in Business Over 1918, Distributor Shows

Figures Indicate Demand Is Stronger Than That of Year Before War

DETROIT, Feb. 25—Figures compiled by Guy O. Simons, distributor for Willys products in Michigan, strongly confirm predictions of improving business and emphasize the claim that plenty of business exists and that creation of demand is in reality a question of proper merchandising effort. Simons has compiled a chart showing the amount of business done for the last five years by months, showing that in January, 1921, his business amounted to \$105,905.24, as against \$71,223.81 in January, 1918. The 1921 figures look small it is true in comparison with the report for January, 1920, showing business aggregating \$359,928.84.

Abnormal conditions existing last year, however, were responsible for the apparently big discrepancy between the sales for the two years, and the big feature lies in the fact, as Simons contends, that if the business has been even as low as that of January, 1918, it should have been no reason for discouragement.

"We were all satisfied with the business in 1918," said Simons. "Everybody was making some money and until the period of abnormality when buyers went wild, we were all entirely satisfied with conditions. Everybody must understand this fact and take it to heart and realize that a business on a par with pre-war demand should be highly satisfactory."

As evidence of the rapid improvement Simons' figures show that December business was approximately \$10,000 greater than that of November, the lowest month since the period of depression started last summer. January figures show an increase of \$30,000 and the business for February will show an even greater increase. Another significant factor also revealed by the figures that November, though the lowest month for the depression period, was not the lowest month in point of sales and business done in the last four years, and this Simons says, will apply not only to his own company but to all others.

Southern Carolina Will Hold Another Good Roads School

Columbia, S. C., Feb. 26—Plans for another good roads school to be held at the University of South Carolina March 15-16 are rapidly being completed by the engineering department of the university and by officials of the state highway department.

The first good roads institute at the university was held last year and was a decided success. Various types of roads for different sections of the state, problems met with in road construction and highway building from every angle are discussed at these institutes to which are invited all road officials in the state.

Among the speakers are A. Mason Gibbes, president of the South Carolina Automotive Trades Association; H. G. Shirley, highways industries association of Washington; W. S. Keller, state highway engineer of Alabama; C. H. Moorefield, state highway engineer of South Carolina; some ten or twelve county highway engineers of this state and several men from the state highway department. The indications are that the institute will be well attended. Automobile dealers of this state have always encouraged these institutes in every way possible.

Truck Drivers Hear Service Phases at Monthly Meetings

Des Moines, Feb. 26—The sale of an automobile truck does not end the dealer's debt to the purchaser, in the opinion of the Consign Motor Truck Co. of this city, which is determined to have its buyers get the most out of the power haulers which they own. The company recently issued invitations to the drivers of trucks purchased from it, and entertained them at a meeting, this session being the first of a series of monthly gatherings.

First in line at the gathering was a talk by an expert on automobile trucks, and then followed refreshments and cigars. At each of the monthly meetings, the Consign company plans to have an expert on hand. Talks will be given on each of the different units and service phases of the truck.

Activities for Spring Work Revived by Dallas Garagemen

Dallas, Texas, Feb. 26—Plans are being laid for a revival of the activities of the Dallas Garagemen's Protective Association with the coming of the spring. The organization was formed last year and the members declared much good resulted from it.

The chief aim of the association is to develop a better feeling of co-operation and confidence between the garagemen and the public and to protect the garagemen from unscrupulous motorists and persons "who have acquired cars in questionable manners." R. W. Kemp is president of the organization and C. E. Swallow, secretary. Mr. Kemp declares the association is one of the essential cogs in the wheel of the automobile industry in Dallas and is closely co-operating with other bodies of the city.

MOTORCYCLE RACE AT SAVANNAH

Savannah, Ga., Feb. 24—One of the biggest motorcycle race meets of the year will be held on the Bethesda course here, April 26, the announcement having been made that a number of motorcycle drivers of national note will participate in the event. The races will probably be held under the auspices of the M. & M. T. A., this organization having been asked to sanction the meet. The principal event will be a 100 mile race.

Program for Year's Work Is Laid by Truck Salesmanagers

Homer Hilton, New Managing Director, Working on Definite Plan of Procedure

CHICAGO, Feb. 26—The Directors of the National Association of Motor Truck Sales Managers at a meeting here laid a comprehensive program for accomplishment in 1921, and while their definite plans have not been announced it is believed that the scope of their activities will be considerably broadened.

Homer Hilton, one of the directors, who has just severed his connection as sales manager of the Oshkosh four wheel drive truck was elected "managing director" and has assumed active charge of the association's affairs pending the selection of a general manager. Mr. Hilton is making an analysis of the past work of the association and will shortly submit to its members a definite plan of procedure which is thought will create a closer bond of co-operation between factory sales departments and truck dealers.

The association was organized two years ago for the purpose of correlating factory sales policies with the local needs of truck dealers in the belief that closer harmony of operating plans would augment for the greater success of the motor truck industry as a whole.

The work of the association now incorporates the plan of assisting dealers in the reorganization of their affairs, in order that all possible selling force may be had at this time to help bring truck sales volume back to normal. The officers of the association are: President, H. T. Boulden, vice-president and salesmanager of the Selden Truck Corp.; vice-president, E. T. Herbig, sales manager of the Service Motor Truck Co.; secretary and treasurer, A. E. Schafer, sales manager of the Gramm-Bernstein Motor Truck Co.

Completing Organization of Washington Automotive Trades

Seattle, Feb. 26—Complete organization of the automotive trades in the state of Washington is expected to be completed by the latter part of March and plans are already being discussed for a big state-wide convention of the new state association early in April. While the campaign for membership was only launched about two months ago the responses have gone beyond all expectations.

The scope of the Seattle Automotive Trades Association has been broadened to take in the whole of King county. At a recent meeting, in which the new lines of the association were formally extended, there were members present from the small towns throughout the county. Discussion of credit information, collection of accounts, together with legislative matters, comprised the major part of the business meeting.



A Somber Military Hall Changed Into an Arbor

Italian art has been utilized this year to effect an architectural transition of the Armory where the Louisville, Ky., show was staged. The pergola is the motif that prevailed throughout the building. Each booth represented a small pergola, so arranged and decorated that the general effect of all the booths presented one large arbor of trellis work, in which each booth was a cedar-covered bower

Louisville Fires Broadside In Its Yearly Sales Campaign

Opens Annual Automotive Show and Holds Dinner for Kentucky and Indiana Dealers

LOUISVILLE, Ky., Feb. 26—Under conditions, rich with promise, filled with energy and overflowing with enthusiasm, Louisville's thirteenth annual automotive show opened Monday evening with sixty-six exhibitors sharing the Armory.

The exhibition is the opening broadside fired by the combined automobile companies in the yearly sales campaign and is really the start of the new season's business in this section of the Ohio valley.

The automobile retail business in the Ohio valley has started on an upgrade—the lowest point of the natural post-war depression was left behind in November and was weathered satisfactorily by the dealers. This is a condensation of the views of dealers here. Business last year was as good as could have been expected. The average dealer hasn't made much money during the past four months. Some have lost money. But it's getting over now. The bottom pit of the business depression came in November.

Despite eight inches of snow—the heaviest of the winter—a large and more enthusiastic crowd visited the show on the opening night than on any previous first night, officials of the Louisville Automobile Dealers' Association declared. While none of the dealers expects to sell as many cars at the 1921 exhibition many of them had reported sales on the second day of the show. Everyone is optimistic, for the visitors are intensely interested in the exhibits and a greater

number of live prospects are in attendance than in the past.

At the first annual banquet of the automotive dealers of Kentucky and southern Indiana, as guests of the Louisville Automobile Dealers' Association, held in connection with the show, renewal of a strong demand for cars by the summer months was predicted.

The dinner was attended by 400 automobile dealers, business and professional men. Prince Wells, president of the association, who left a sick bed to be present, was in charge in opening the program and stated that the banquet would be made an annual affair in connection with the show. Speakers included George M. Graham, vice-president of the Pierce-Arrow Motor Car Co.; Harry S. Leyman, president of the Leyman-Buick Co., of Cincinnati and Louisville; and George C. Hubbs, general manager of the Grant Motor Car Corp., of Cleveland. William A. Thomas, vice-president of the association, was toastmaster.

MEXICO CITY SHOW DATES SET

Mexico City, Feb. 24—The dates for the automobile show at Mexico City have been definitely decided upon as April 10 to 25. The show will be held in the National Theatre under the auspices of Parcal Ortiz Rubio, secretary of communications. Apparently most of the forty-two American cars represented in Mexico will be on display.

FORT WAYNE SHOW IN MARCH

Fort Wayne, Ind., Feb. 24—The date and place for Fort Wayne's annual automobile show was determined at a meeting of the local dealers' association. It was decided to hold the show at the Concordia college gymnasium from March 10 to March 16 inclusive. It will be in charge of an executive committee.

Parts Makers Will Continue Their Distributing Stations

Meet With Truck Manufacturers to Talk Over Situation— Dealers Affected

CHICAGO, Feb. 25—Representatives of the Motor Truck Manufacturers' Association and parts and unit makers met at an all day session at the Hotel La Salle yesterday to discuss the question of service and distributing stations which the manufacturers of parts and units have been establishing throughout the country and which, it is felt, will affect more and more as time goes by the business of the truck dealer.

The discussion brought no tangible results though it indicated that there is very little disposition on the part of the parts and unit makers to relinquish the ground they have already gained or to stop from continuing to establish stations with the ultimate view of twelve hour service. It is expected that they will adopt a program of future procedure in the matter of opening up new territory and will submit it to the truck manufacturers for suggestions.

New Angles Developing

The invitation for the conference was extended by the truck association and was accepted by a large proportion of the parts and unit makers who either have already established stations or are contemplating doing so. New phases of the situation are continually cropping out making a satisfactory solution of the problem equally difficult for both branches of the industry. It is not felt that the difficulties by any means have been ironed out as yet and subsequent conferences doubtless will be necessary.

Individual service and distributing stations for parts and units were started by the makers several years ago but not until recently has the expansion been so great as to cause the truck manufacturers to take action. Now there is a determined move on the part of the manufacturers to do something.

There are indications that in cities where one part is being handled by a parts maker distributor, this same distributor will take on the product of some other parts maker thus doing away with a multiplicity of parts station in any one community. The expansion of such stations necessarily will affect the regular truck station handling service for where a part can be purchased from a parts station direct service will be done either at that station or at a repair shop nearby in cases where the parts distributor does not handle service.

Such a condition will mean that the truck dealer or distributor service station will find its profits from the service end of his business considerably curtailed unless some arrangement can be effected whereby as complete a stock of parts can be carried as carried by the parts distributor and that the dealer or distributor of trucks will find his sole business to be in selling trucks.

Rolls-Royce Is Producing Two Cars Weekly at American Plant

Factory Has Capacity of One Car Daily—Practically Everything Made Here

SPRINGFIELD, MASS., Feb. 25—Six hundred workmen are engaged in work in the Rolls-Royce factory in this city where the Rolls-Royce car is being completely manufactured on the same standard of excellence as in the home factory at Derby, England. The factory has a capacity of a car a day but at present the company has not gotten into production higher than two cars a week. Practically everything entering into the car is manufactured in the plant with the exception of electrical equipment imported from England, and with possibly one exception, all of the forgings are American forgings. With the exception of cylinder and crankcase castings there are not over two or three castings in the car, forgings being used in nearly every place. The machine shop with 60,000 sq. ft. is equipped throughout with American machine tools with the exception of one or two special machines imported from England, one of which is a cam-grinding machine.

Of the 600 workers all are American, with the exception of thirty-five department heads brought from the home factory in Derby. The company has a series of evening classes for educating the workers up to the Rolls-Royce principles of manufacture. There has been brought from the home factory a complete set of pieces used in the car and where one piece such as shaft in the gearbox, for example, has several different operations, there have been brought as many shafts as there are operations so that the workman performing each operation has a piece from the home factory just as it is in the operation he is working on.

OLD TIMERS OPEN OFFICES

Detroit, Feb. 24—The Old Timers' Club which was organized during the national automobile show held in Chicago this year has opened headquarters at 420 Book building, this city, in the offices of F. E. Spooner who is secretary and general manager of the association. There are now 1,500 applicants for membership and an active campaign will be inaugurated immediately to bring the organization to five figures in point of members.

Revival Planned for Grand Prize and Vanderbilt Races

New York, Feb. 25—The New York Automobile Dealers Association has proposed the revival of the Vanderbilt and Grand Prize automobile races over the historic courses at Westchester or Long Island. Vigorous interest in a revival of racing having manifested itself recently, E. S. Partridge was appointed by the

directors of the association as chairman of an executive committee to take charge of a racing program.

In the event that the program to revive the Vanderbilt Cup and Grand Prize races meets with success it is believed that W. C. Poertner, president of the association and a racing enthusiast, will make every effort to bring national racing teams back into competition. Since the dismantling of the Sheepshead Bay speedway, New York has been without motor racing of any kind.

West Baden Meeting for Week Preceding Indianapolis Race

Chicago, Feb. 26—The Annual Summer Meeting of the Society of Automotive Engineers will be held at West Baden Springs Hotel, West Baden, Ind., May 24 to 28, inclusive, and upwards of 900 to 1,000 members, ladies and guests are expected to attend what gives promise of being one of the most important meetings in the history of the society. There will be sessions devoted exclusively to farm tractors, motor trucks, motor cars, aviation, motor fuels, etc.

The date set being the week previous to the Indianapolis Speedway race, was selected to permit members to attend the race, as the meeting will end Saturday noon May 28, and the race will take place Monday May 30. West Baden is 130 miles south of Indianapolis. In connection with the S. A. E. meeting, one-half of each day will be given to convention sessions and the afternoon to sports. A very comprehensive sport program similar to last year will be conducted. West Baden is famed as a resort for its mineral springs, mineral baths, golf courses, and recreation features.

RICHMOND DEALERS IN ONE BODY

Richmond, Va., Feb. 26—Richmond Automotive Trades' Association, Inc., will hold its annual automobile show the week of March 12. The show will be the largest in the history of the city as the entire automobile trade of the city has just been combined into one association through the adoption of a new name and policy. Formerly only automobile dealers were admitted to membership but now accessory, truck and used car dealers are admitted. J. A. Kline, of the Kline Car Co., has been elected president.

A STUMP PULLER FOR FORDSON

Enterprise, Ala., Feb. 25—Henry A. Dorsey, recently demonstrated a new stump pulling device of which he is the inventor, and which, when attached to a Fordson tractor, accomplishes the feat of pulling about 400 stumps daily. The machine has a 3,500 hp. delivered off the drum. Two to six stumps were jerked out at a single pull. The device is known as the Dorsey Stump Puller and Skidder and has been fully patented with the probable intention of manufacturing it for distribution as a sort of a tractor accessory. The present plan is to distribute the device through tractor and implement dealers.

De Palma Sets Record and Wins Year's First Championship Race

Drives Fifty Miles at Average Speed of 107.3 Miles Per Hour in Opening Event

LOS ANGELES, Feb. 27—Driving fifty miles at an average speed of 107 3/10 miles per hour Ralph De Palma on Beverly Hills speedway won the opening event of the new championship season this afternoon. Tommy Milton was second; Roscoe Sarles third and Jimmy Murphy fourth. De Palma established a new fifty mile record for 183 inch cars.

Preceding the final race were four sprint matches of twenty-five miles each. De Palma won the first from a field of nine starters averaging 106 miles per hour. His last lap was better than 111 miles per hour, the fastest the track ever was driven. Sarles won the second heat averaging 107 miles an hour. Murphy won the third heat averaging 102 miles per hour. Milton won the fourth averaging 104 miles an hour. The winners did not start in succeeding heats. The time was the fastest and the driving the best ever seen here. It was De Palma against the field, all but one of the other drivers using Duesenberg motored cars. The exception was Sarles in a Monroe.

The crowd was large and very enthusiastic. De Palma's victory was popular. His Ballot seemed to have more in reserve than the other cars as shown in the final when in the last two laps he easily distanced Sarles who had led until then. Milton pushed De Palma to the last and lost by less than a car length. De Palma won \$4000 and 108 points; Milton \$4175 and 100 points; Sarles \$2500 and 75 points; Murphy \$1550 and 45 points. Five place prizes were paid in the heats and four in the final.

DUESENBERGS FOR GRAND PRIX

New York, Feb. 26—Four Duesenberg eight-cylinder racing cars have been entered in the Grand Prize automobile race to be run in France in the summer of 1921. Entry of these was made by cable this week by Albert Champion who conceived the idea of making such an entry during the recent Chicago motor show. The cars are the property of Duesenberg Bros., who have manufactured them. The cars are similar in design to those raced last year, having eight cylinders in line, cylinders 2 1/2 by 4 1/4 in. giving a piston displacement of 183 cu. in. which is the maximum allowed in the race. The engines are valve-in-the-head designs with overhead camshafts, and three valves per cylinder, two exhausts and one intake. They are expected to weigh approximately 1950 lbs.

Indianapolis, Feb. 21—Tommy Milton has entered the ninth annual 500 mile sweepstakes which will be held at the Indianapolis Motor Speedway on Decoration Day. He will pilot a Durant Special owned by Cliff Durant.

Cash Basis for Industry in Three Months, Says Yeoman

Continental Motors Executive States That Increase of Business Will Continue

NEW YORK, Feb. 21.—Business of the Continental Motors Corp. is increasing according to an optimistic statement on the business outlook made by G. W. Yeoman, vice president and treasurer of the company in response to a request for information made by Sidney S. Meyers, general counsel of the Motor & Accessory Manufacturers Association. After pointing out the impetus given by the New York and Chicago shows, Yeoman says that nearly 1,000 men have been added to the force employed in the Detroit plant to get out this month's demands and that orders for delivery for March will be from 30 to 40 per cent greater than February.

"If anyone tells you this is only a little spurt and that the demand will decrease, tell them they are crazy," says Yeoman. "Sixty to ninety days from now the automobile business through the possibilities of liquidating large stocks of inventory, should be in a very advantageous position to again establish itself on a cash basis. The sale of trucks has not yet started in any volume although we have orders on hand from about 60 per cent of our customers for shipment the latter part of February and for the months of March and April.

"Our entire organization is of the firm belief that the automobile and truck industry is built on a strong foundation and that its products are as necessary to the upbuilding by this country as the raising of foodstuffs and other so-called staple articles."

GAS PRICE REDUCTIONS

New York, Feb. 23.—Gasoline prices have been reduced from 1 to 6 cents a gallon in the principal cities east of the Rocky Mountains but no reductions have been made as yet on the Pacific coast. Reductions of 3 cents have been made throughout the eastern territory and of 4 cents in the middle west. In the mid continent and southwest territory prices have declined in some cities as much as 6 cents a gallon from the peak of 1920. The lowest price is in Kansas City where it is 21 cents a gallon with St. Louis second at 22.5 cents. Chicago and Houston, Texas, are tied for third place at 23 cents. The price is highest at Butte, Montana, where it is 31 cents.

GOVERNMENT DEFERS ROAD AID

Washington, Feb. 24.—Efforts to force a continuation of Federal aid appropriations for highways by a rider on the Postoffice appropriation bill were defeated in the Senate and assurance given that the proposed plan for a national system of highways as advocated by the automotive industry and organized automobile owners would be considered at the extraordinary session of the next

Congress. Senator Thomas, Democrat, of Colorado, supported Senator Townsend, Republican, of Michigan, and chairman of the Senate committee on Post-offices and roads, in opposing the amendment of Senator Swanson of Virginia. The Colorado Senator's threat to filibuster indefinitely against the proposed amendment served its purpose and the senate rejected the Federal aid proposition.

Fifty 2-ton Trucks Sent to Mexico

BROWNSVILLE, TEXAS, March 1

—What is said to have been the largest single shipment of motor trucks, trailers, tractors and automobiles ever sent into Mexico passed through here a few days ago. Included in the shipment were fifty 2-ton motor trucks. The shipment was made by the Southern Motor Manufacturing Co. of Houston and was consigned to J. Warner, distributor, City of Mexico. The train was kept intact from the time it left Houston until its arrival in the City of Mexico, the same locomotive being used all the way. At the Rio Grande crossing point here the customs officials expedited the movement in every possible way.

PRIVATE SHOW IN DENMARK

Copenhagen, Jan. 17.—K. W. Christensen, distributors in Denmark of the Buick, Hupmobile, Denby and Clydesdale have just completed holding the largest private exhibition ever staged in this city. About forty different passenger cars and trucks were exhibited, some in the sales room of the main building of the establishment and others in the open yard which, for the purpose, had been covered with a tent. The exhibition at which the public was entertained by music and by movies showing motor car factories was visited by about 3,000 persons and aroused much attention among the motor interested people in Copenhagen.

KELLER WITH CHEVROLET

Flint, Mich., Feb. 25.—K. W. Zimmerschied, general manager of Chevrolet Motor Co., announces the appointment of K. T. Keller as manager of manufacturing to fill the vacancy left by the resignation of F. W. Hohensee. Mr. Keller has been in the General Motors organization since 1911, having been advanced to the position of superintendent at the Northway Motor & Manufacturing Co. by 1913. From 1917 to 1919 he occupied the position of general master mechanic at the Buick Motor Co., and since that time has been connected with the general operations staff at the central office of the General Motors Corp. in Detroit.

Referendum of Chamber of Commerce Against Sales Tax

Members Ask for Repeal of Excess Profits and Levying of Excise Taxes

WASHINGTON, Feb. 25.—Representatives of the automotive industry who have felt that there was little probability of Congress levying additional excise taxes and that there would be a substitute for levies which now are unpopular, will find cold comfort in the report of the committee on taxation of the Chamber of Commerce of the United States, recounting the results of a national referendum on 15 proposals for changes in the present taxation system.

There was an almost unanimous demand among the members of the chamber for a repeal of the excess profits tax but THERE WAS A MAJORITY VOTE AGAINST ANY FORM OF SALES TAX SUGGESTED BOTH AS A SUBSTITUTE FOR AND IN ADDITION TO OTHER FORMS OF TAX. The proposal that excise taxes should be levied upon some articles of wide use but not of first necessity, partly to take the place of the excess profits tax, was carried by more than a two-thirds vote. The ballot on this question stood: for, 1217; against, 504.

On the question, "should a sales tax be levied instead of the excise or excess profits tax," the vote was: for, 704; against, 855. Those who favored a retail sales tax and those who favored a general turnover tax were about evenly divided.

The committee submitting the report opposed the sales tax but put the proposal to a vote because of the wide interest manifested in a levy of this nature. The vote against a tax of this nature is significant in view of the strong agitation throughout the country in favor of it.

The National Automobile Chamber of Commerce is the only organization connected with the industry which has gone on record formally in favor of a sales tax although the Motor & Accessory Mfrs. Association and the Rubber Association of America are in favor of a sales tax, though not on retail sales as proposed by the N. A. C. C. The proposal of Secretary of the Treasury Houston, that the excise tax on passenger automobiles be doubled is strongly favored by many of the Congressional leaders and members of the United States Chamber of Commerce who voted in favor of such action did so with the understanding that excise taxes levied should be supplemental to those now in effect.

There is a strong sentiment in Congress against any form of sales tax. The professed belief among senators and representatives is that if a 1 per cent tax on sales were authorized, many unscrupulous dealers would use it as a means of bringing in additional profit by adding to their prices several times the amount of the sales tax.

No Refinancing Is Now Being Planned for Willys-Overland

Bank Creditors, However, Have Formed Committee to Protect Their Interests

NEW YORK, Feb. 26—Bank creditors of the Willys-Overland Co., Inc., have formed a committee headed by Ralph Van Vechten of the Continental & Commercial Bank of Chicago to protect their interests. The committee includes John Sherwin of Cleveland; Joseph Wayne, Jr., of Philadelphia, and several representatives of New York banks and banking houses.

The committee was formed because of the close relations existing between the Willys-Overland Co. and the Willys Corp. The affairs of the Willys Corp. have been taken over by a bankers committee which is working in harmony with another committee representing merchandise and construction creditors.

The banks interested in the Willys-Overland Co. are by no means identical with those which have made heavy loans to the Willys Corp. and the Chase National of New York which is probably the largest bank creditor of the corporation, is not represented on the other committee. It is understood however that the two committees do not conflict in any sense and they will co-operate so far as possible for the good of the two companies.

The affairs of the Willys-Overland are not involved directly with those of the Willys Corp. although 27 per cent of its common stock is owned by the corporation. It is understood that no refinancing is contemplated for Willys-Overland in the immediate future nor has any merchandise creditors committee been formed up to this time.

Large blocks of the first and second preferred stock of the Willys Corp. has been deposited with protective committees which have been formed and preliminary conferences already have been held with the bankers committee. The creditors committee states that the number of claims already assigned to it is entirely satisfactory and that it is not expected serious difficulty will be encountered in obtaining the extension of time sought.

DAYTON AUTOMOTIVE WHEEL CO.

In the advertisement of the Dayton Automotive Wheel Co. in *MOTOR AGE* of Feb. 10, the third from the last word in the fifth line from the top of the copy should have been "Highest" instead of "Lightest." The copy should have read: "Both represent the highest type, etc."

MAIBOHM SALES INCREASE

Sandusky, Ohio, Feb. 26—The annual report of President H. C. Maibohm of the Maibohm Motor Co. shows that sales of Maibohm sixes increased 150 per cent in 1920 over the sales of the preceding

year and that profits for the year, before taxes and reserves, amounted to approximately 12 per cent on the outstanding capital. Dividends totaling \$83,475 were paid during the year. All officers were re-elected as follows: President, H. C. Maibohm; vice presidents, T. W. Cushing, W. C. Maibohm and B. C. Kramer; secretary and treasurer, W. J. Corr. They with George M. Zimmerman, city manager of the City of Sandusky, and Hal Holtom, chief engineer of the company, constitute the board of direc-

School for Drivers Opens in Milwaukee

MILWAUKEE, Feb. 28—A notable effort has been undertaken by the Safety Division of the Milwaukee Association of Commerce in establishing a drivers' school in which more than 1,000 owners and operators of motor vehicles have been enrolled. The school will consist of ten bi-weekly meetings, held in the lecture hall of the Milwaukee Public Library. At each meeting two lectures will be given, one on a technical automotive subject, and the other on question of public safety.

The technical lecturers include G. W. Smith, chief engineer, Nash Motors Co.; E. E. Consoliver, dean of the automotive department, School of Engineering of Milwaukee; Ben F. Anger, Anger Engineering Co.; J. M. Stevens, Packard Motor Car Co. of Chicago; P. J. Batenberg, chief engineer, Mitchell Motors Co., Racine, and H. O. Penn, Wisconsin Motor Mfg. Co. Drivers who attend eight out of the ten lectures will be presented a suitable certificate at the close of the course on June 21.

tors. The Maibohm factory has not been closed for even one working day and anticipates a return to capacity production within the next few weeks.

VAN SICKLEN SPEEDOMETER SOLD

Chicago, Feb. 25—The Stewart-Warner Speedometer Corp. has purchased the speedometer business and assets of the Van Sicklen Speedometer Co. of Elgin, Ill. This is the second time that the corporation has taken over a large competitor. The Warner Instrument Co. was acquired in 1912, the consolidation forming the basis for the present corporation.

N. A. C. C. MEETING MARCH 3

New York, Feb. 24—A general meeting of the members of the National Automobile Chamber of Commerce will be held Thursday, March 3. The passenger car manufacturers will meet in the morning and the truck manufacturers in the afternoon. The directors of the Chamber will meet Wednesday morning March 2 and the motor truck committee the afternoon of the same day.

Conference Prohibits Taking Out Confiscation Insurance

By Ruling Not Possible to Protect Automobile That Is Seized Under Volstead Law

NEW YORK, Feb. 26—"Confiscation insurance" is forbidden to all insurance companies belonging to the National Automobile Underwriters Conference, by a recent decision of that body. As practically all the large stock insurance companies covering automobiles belong to the conference, this action means practically that it will not be possible to get insurance on an automobile against its being confiscated by the Federal government for having been caught carrying liquor in violation of the Volstead law.

Insurance underwriters have in general been of the opinion that violators of the Volstead law were not entitled to insurance; and that practically all innocent victims of confiscation already insured against theft would be able to claim indemnity on the ground that the car was stolen. Perhaps the only protection which could be asked of insurance companies was against misuse of the car by a friend.

But the underwriters maintained that if this were to be covered, every enterprising bootlegger would frame his case to correspond, with the result that insurance companies would find themselves betting against a bootlegger's risk of capture.

A recent ruling of a Federal court provides that automobiles "held for trial" may be taken out on bail, that is, for deposit with the court of collateral security. If an owner feels that his car is not likely to be confiscated, that he has an open and shut case, he can, under this ruling, provide care of the car to prevent deterioration.

RECEIVER FOR PORTER MAKER

New York, Feb. 26—George C. Van-Tuyle, Jr., has been appointed by Federal Judge Knox as receiver for the American & British Manufacturing Corp., in a suit brought by the American & British Securities Co., a creditor for \$37,516. Its claims are for money loaned but it also holds 23,265 shares of the preferred stock of the manufacturing corporation and 31,277 shares of the common. The petition alleges that the defendant company is financially embarrassed although it is considered solvent.

MASTER TRUCK PRICES

The correct prices of Master trucks, product of Master Trucks, Inc., which were incorrectly quoted in the specification tables published in *MOTOR AGE* of Jan. 27 are as follows: Model JW, 1½-ton, \$2,690; W, 2½-ton, \$3,290; D, 2½-ton, \$3,540; A, 3½-ton, \$4,190; E, 3½-ton, \$4,640; B, 5-ton, \$5,290; F, 5-ton, \$5,440. All prices are f. o. b. Chicago with war tax to be added.

Stimulation Given Plan for Organizing Michigan Dealers

Saginaw Votes to Participate and Bay City and Flint Will Take Like Action

SAGINAW, Mich., Feb. 26—Plans for organization of the Michigan Automobile dealers into a state association, were given impetus at a gathering here attended by 240 dealers from Saginaw, Bay City and Flint. A banquet at the Elks Club was followed by a visit to the Saginaw Auto Show.

Guy O. Simons, of the Simons Sales Co., Detroit, who is a director of the N. A. D. A., and Harry G. Moock, secretary-manager of the N. A. D. A., spoke at the banquet, at the conclusion of which it was voted unanimously by the Saginaw dealers to affiliate the proposed new state association. The delegations from Bay City and Flint also expressed themselves as anxious to participate, and assured Mr. Moock that formal action to that end would be taken at meetings to be held in the two cities prior to the organization meeting which is to be held in Detroit in April.

Favors City Zoning

Simons pointed to the difference between the salesman and the order taker and declared it was the duty of every dealer to know that each salesman in his employ was working every minute of the day, and if he was not, he should be discharged. He told of his own plan to zone the city of Detroit and give each salesman a beat just like a policeman, on which he must know everyone and be able to tell any minute just how many actual prospects resided in his territory.

Ed. Lunt, vice-president of the Flint Dealers' Association, followed Simons, and C. E. Dawson, sales manager of the Chevrolet Motor Co., gave a brief talk in which he urged the dealer to show his men how to do their work, and show them that the dealer was actually interested in their efforts.

"We have arrived at a period when it is a question of selling and continued and persistent effort on the part of the salesmen," said Dawson. "I gave up golf and quit my club some time ago and got down to real work, and that's what all of you have to do if you are going to get any of the business and there is lots of it here for the man who is willing to go out and make the right effort to get it."

Moock followed Dawson urging co-operation and the value of the association. With a chart he showed the dealers the efforts that has been and are being made by the national association in their behalf, and explained to them that only through association efforts could the dealers hope for many reforms that long have been hoped for.

Moock complimented the Saginaw Association and particularly its plan of operation requiring a hundred dollar deposit of each dealer affiliated and a fine of \$10 for any dealer failing to appear at any regular meeting. Garage-

men and tire dealers are associate members of the Saginaw organization, who also are compelled to post a sum upon assuming membership, and are subject to a fine of \$1 for absence at any of the meetings. There are twenty-four active dealers and 105 associate members in the Saginaw Association and Moock said the fact that there had not been a failure in Saginaw in several years and that attendance records showed an average of 90 per cent indicated the success that is attendant upon associated efforts.

Reductions Made in Prices of Main Power Light Plants

Cleveland, Feb. 25—The Main Electric Co., manufacturer of Main Power Light plants, has made substantial reductions in the prices of its products, effective Feb. 15. The prices listed below are the new prices, the prices as they stood Oct. 15, 1920, and the prices that were effective a year ago, Feb. 15, 1920.

Type plant MAF, \$195, \$235, \$300.

MCF, \$245, \$290, \$350.

1-CF, \$295, \$390, \$440.

1-EF, \$365, \$460, \$515.

1-CXF, \$355, \$490, \$550.

1-EXF, \$425, \$560, \$625.

3-EF, \$650, \$690, \$800.

Types 11-AF, 13-BF and 14-CF, not built during the war, are priced at \$690, \$785 and \$895, respectively. All prices are f. o. b. factory.

U. S. MOTORS IN KANSAS CITY

Cincinnati, Feb. 24—The United States Motor Truck Co. has established a new distributing connection for the Kansas City district, the new concern to be known as the United States Truck Sales Co. of Kansas City. This branch is affiliated with the United States Truck Sales Co. of St. Louis and the Marion Motor Co., of Centralia, Ill. J. F. Mackey of Centralia is president of the three organizations and J. A. Pope is general manager.

Reserve Stocks of Gasoline Continue to Show Increase

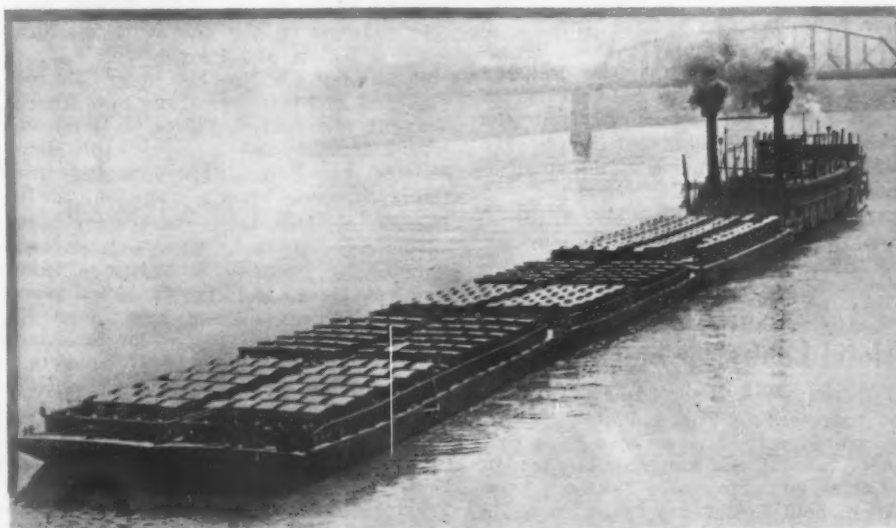
Bureau of Mines Finds Noticeable Change of Character of Present Day Fuel

WASHINGTON, Feb. 25—Reserve stocks of gasoline continued to increase during December despite extensive use of automobiles which was permissible with mild weather. Refinery statistics compiled by the Bureau of Mines shows that the daily average production for December was 14,980,431 gallons, or about 107,000 gallons less per day than in November but four million gallons more than in daily average for December 1919. Stocks advanced 108 million gallons over November.

Bureau Completes Survey

At the close of the year, there were 462,381,837 gallons of gasoline in reserve at refineries. This figure is equivalent to the entire production for the month showing a marked decrease in consumption. Production of lubricating oil increased the reserve by eighteen million gallons over the stocks held in November. The 328 refineries operating during December had a daily capacity of 1,714,395 barrels of crude oil.

The Bureau of Mines has just completed a third motor gasoline survey which shows that there has been a noticeable change in the character of motor fuel marketed today. The average boiling point of the sample gasoline collected in various cities is 263 degrees Fahrenheit as compared with 264 a year ago. The Bureau claims that these tests prove that the average gasoline sold at service stations is fully as volatile as that marketed a year ago. They found unmistakable evidences of a greater proportion of gasoline made by blending casing-head or natural gas-gasoline, and naphtha.



Four hundred automobiles consigned to dealers in the South by a Detroit automobile manufacturing company passing down the Ohio River at Cincinnati. The barges were towed by the largest towboat on the Ohio. Just think how glad John D. will be when he sees this picture

"Nera Car" Soon to Make Its First Appearance In America

Company Headed by Former Willys Executive will Manufacture Product at Syracuse

SYRACUSE, Feb. 26—Manufacture of the "Nera Car," the new product of the Nera Car Corp., recently formed in this city, will commence within a few weeks when the company takes possession of a four-story brick building with 28,000 sq. ft. of floor space.

J. Allan Smith who recently resigned as vice-president of the Willys Corp. in charge of the New Process Gear Division to head this new company today made the following statement concerning the financing of the new company:

"Nera Car Corp. is capitalized at 10,000 shares of 8 per cent cumulative preferred stock and 20,000 shares of no par value common stock. For our present needs there has been an authorized sales of 5,000 shares each of the preferred and common, all of which is closely held. There has been no public offer and financing has been completed."

Mr. Smith holds the controlling interest in the company and is president and general manager. C. L. Lane who had been associated with him in the U. S. Light & Heat Co. of Niagara Falls is secretary and treasurer.

It is generally understood that the new vehicle will be two or three wheeled. Rights to manufacture the product in Great Britain were sold to a British corporation and is in production. The American product will be assembled at the Syracuse plant, the engine being the principal unit manufactured here.

TWENTY YEARS BRANCH MANAGER

Boston, Feb. 21.—In recognition of the twentieth anniversary of his connection with the White Co., as New England branch manager, J. S. Hathaway was given a luncheon by the company's field managers at the Copley Plaza. Representatives of the various New England offices were present and telegrams of congratulation were received from the home office in Cleveland and from branch managers in many parts of the country. Those attending the luncheon included F. P. White, C. A. Gilmore, W. A. Stiles, W. A. Coleman, A. S. Lee, G. H. Jennings and H. G. Chase.

No Auditorium So Dealers Use Hotel Lobby for Staging Show

Superior, Wis., Feb. 28.—Eleven dealers, representing fifteen distinct factories, exhibited twenty-two models of passenger cars at the first annual show of the Superior Automotive Dealers' Association, held Feb. 21 to 26 in the main lobby of the Hotel Superior, the only available exposition place. The association was organized only a few months ago. In past years Superior dealers have held small shows as a group of individuals.

One of the objects of this year's organized show is to impress the people of Superior with the dire need of providing an auditorium. The Rotary club has joined the dealers' association in a campaign to be undertaken immediately to raise funds for a public exposition and assembly hall.

Members of the Superior dealers' association are: Allan Peck Co., Caesar Motor Co., Superior Tire & Motor Co., Superior Motor & Machine Works, Knudsen Automobile Co., Inc., Central Motor Service Co., Motor Inn, Inc., South Superior Motor Co., Carlson Motor Co., Webb Motor Co., Olson Bros. Auto Co., and Russell S. Sherman, Inc. The show management was in charge of D. S. Webb, head of the Webb Motor Co., with James Flaherty as executive director.

License Bill, Fathered by Iowa Trades Bureau, Passed

Des Moines, Feb. 26.—The Iowa Motor Trades Bureau has won the first lap in its legislative program. The senate of the Iowa legislature this week passed the Whittemore bill, fathered by the bureau which changes the methods of paying motor license fees.

According to the new law fees will be paid quarterly instead of once a year and cars purchased in April, May or June will pay only three-fourths of the annual fee. Cars registered in July, August or September will pay half the annual fee and cars purchased in October or November will pay one-fourth. Cars registered in December will not be required to pay a fee for that month but must take out a license for the next year.

Fuller Storage Battery Co. in Hartford Is Reorganized

Hartford, Conn., Feb. 26.—Efforts of a former member of the firm to obtain the controlling interest in the Fuller Storage Battery Co., of this city, resulted in litigation and a reorganization of the concern which is one of the largest battery stations in the east with stations in New Haven and Providence.

H. H. Oleson of New Haven was elected president and manager of the New Haven branch; Sherman A. Fuller of Hartford, treasurer; Edmund A. Rogers of Manchester, vice president and manager of the Providence branch, and Willard B. Rogers of Manchester, secretary and advertising manager. The business was founded by Sherman A. Fuller in 1915. The New Haven and Providence branches were opened two years ago. John E. Bolger, a former member of the firm, and others who held stock have sold out their rights.

DEATH TAKES E. H. FULLER

Syracuse, N. Y., Feb. 20.—Ernest O. Fuller, treasurer of the Automotive Service Association of Syracuse died here after an illness lasting six weeks. John H. Sickeninger has been elected to fill the vacancy and Paul Williams, service manager of the H. H. Franklin Manufacturing Co., has been made a director in place of Mr. Fuller.

Hamilton Motors Produces Two New Apex Models

Include 1 Ton and 3½ Ton Latter Being Similar to Previous Designs

GRAND HAVEN, MICH., Feb. 26.—Two new models are announced by the Hamilton Motors Co., a 1-ton speed truck and a 3½-ton truck. The 3½-ton model is very similar in design to the 1½ and 2½-ton Apex trucks, the only difference being in the dimensions of parts. It comprises a Buda 4½ by 6-in. engine, a Fuller 4-speed transmission amidships, a Torbensen rear axle with external service and internal emergency brake, a Shuler front axle, Blood Bros. universal joints and propeller shaft, G & O radiator, Stromberg carburetor, Eisemann magneto, Auto-Lite generator and Lavine steering gear.

The frame is of 7-in. rolled channel steel ¼ in. thick and with 2¾-in. flange, and is suspended on half-elliptic springs. The wheelbase is 160 in., the front tread, 65 in. and the rear tread, 67 in. Wheels are of the wood artillery type, 36 by 5 in. front and 36 by 10 in. rear. The loading space is 168 by 72 in. The standard equipment includes a driver's seat, electric generator, electric head lamp, front fenders, tool box, tools, jack and Alemite grease outfit. The truck will develop a speed of 22 m.p.h., it is claimed.

On the 1-ton speed model a Lycoming 3½ by 5-in. engine is used, together with a Borg & Beck clutch, Muncey transmission, Torbensen axles, Lavine steering gear, G & O radiator, Stewart vacuum feed, Stromberg carburetor and Autolite starting and lighting equipment. The frame of this model consists of 4-in. rolled channel, and is supported by half-elliptic springs both front and rear. The wheelbase is 130 in. and the tread the standard 56 in. Firestone cord tires are carried on all four wheels, the dimensions being 33 by 5 in. In connection with this chassis there will be available eight types of body.

The 3½-ton model lists at \$3,975 and the speed model at \$1,695, both for chassis with seat.

CHICAGO NOMINATES HAY

Chicago, Feb. 28.—Thomas J. Hay, one of the oldest and best known dealers in the city and among the earliest presidents of the Chicago Automobile Trade Association, was nominated president of that organization at a luncheon at the Hotel Metropole today. The annual meeting when he will be elected will be held March 14.

G. M. C. PROFITS LESS IN 1920

New York, Feb. 18.—A preliminary report of earnings by General Motors Corp. for the year 1920, discloses gross sales of approximately \$565,000,000, an increase of \$56,000,000 over 1919. Net profits for the year, \$48,262,000, were shown, however, to be about \$11,800,000 less than in 1919.

Senate Committee Curtails Government Sale of Vehicles

Efforts of Congressman Anthony to Dump Army Equipment on Market May Be Blocked

WASHINGTON, Feb. 24—Recommendations of the War Department for the disposal of surplus automobile equipment placing a limitation upon the number of motor vehicles to be sold or transferred were adopted by the Senate committee on military affairs in reporting the army appropriation bill to the Senate today. The item if passed without amendment would to a large extent block the efforts of Congressman Anthony of Kansas to dump army automobile equipment on the open market. The Senate bill specified that the total transfers and sales during the first six months of the present calendar year must not aggregate in excess of 10,000 motor trucks and 2,000 passenger carrying automobiles.

The House bill which carried the Anthony provision requires the sale and not transfer of motor vehicles. Brigadier General Lord told the Senators this week "the House committee put that word 'sell' in there with malice aforethought so that the money would go into the treasury" and Senator Lenroot, of Wisconsin, agreed with him. Under the proposed legislation now before the Senate all points of law are met because under existing law the War Department must give other Federal departments a choice of trucks. Incidentally this item in the Senate bill embraces the essential features of three bills introduced in the Senate since the House passed the Anthony amendment.

The Senate army bill, however, provides for the sale of 1,000 automobiles more than the House bill. Brigadier General Connor, Chief of Transportation War Department, had recommended that only 300 passenger cars should be sold or transferred because all others were needed for the reserve. He stated that allowing for recent surplus declarations the army owned 4,245 automobiles and that the authorized reduction for the army is 3,800 passenger vehicles so that the government will be short 500 cars when supplies are given the National Guard and reserve officers' training car units. General Connor recommended that it would be better to transfer than sell because of the condition of the automobile trade at present.

Demonstrating Aids Omaha Dealers to Move New Cars

Omaha, Feb. 26—A slight upward tendency in sales since the first of February has encouraged distributors to expect a decided improvement in conditions following the show, to be held March 14-19, on the eve of the natural spring selling season. Though wholesale business in the territory is practically a minus quantity and retail has been very slow since June, there has been quite a bit of city

selling so far in 1921. Quite a few used cars have been moved mostly on the acceptance corporation time payment plan and several aggressive dealers in standard lines without long trades have been able to move a fair volume of new cars. These dealers have been doing a lot of demonstrating.

Opening of wholesale business is not expected until April and May, owing to the poor condition of the trade and the probability that farmers until then will continue to hold grain in the hope of higher prices, thus limiting their own buying power and the circulation of money in the territory.

Philadelphia Dealers Plan to Have Home Gathering Dinner

Philadelphia, Feb. 25—The Philadelphia Automobile Trade Association, in accordance with its custom of holding a banquet following the automobile show, will dine at the Ritz-Carlton hotel on the night of March 5. The "Home Gathering" of last year was so successful that the committee is inviting as the guests of the association about twenty former active members now located in different parts of the country. An elaborate entertainment is being provided.

The banquet committee consists of W. H. Metcalf, chairman; Walter G. Herbert, S. Stankowitch, Jr., and W. B. McCullough.

Keep Hammers From Gasoline Drums, Oil Official Advises

Cedar Rapids, Ia., Feb. 26—Keep hammers away from gasoline drums, was the advice given by W. S. McLeod, Standard Oil official, in an address to distributors and salesmen from northern Iowa at their annual meeting here. Some time ago, the small town of Clarion, Iowa, was practically wiped out when a workman tested a drum to see whether it contained gasoline by tapping it with a hammer. An explosion followed. A small amount of gasoline in the drum will do as much harm as though it were full, Mr. McLeod pointed out, or fumes may prove more dangerous than gasoline.

O. E. Scherer, Oldest Buick Dealer in Wisconsin, Dies

Palmyra, Wis., Feb. 24—Otto E. Scherer, member of the firm of Otto E. Scherer & Son, Inc., distributor of Buick Motor cars for southern Wisconsin and at the time of his death the oldest active Buick dealer in the state, died at his home here Sunday as the result of a general breakdown.

Mr. Scherer was born in Watertown forty-nine years ago and was appointed Buick distributor in 1905. The success of his career was notable. From a small beginning his business grew until in 1910 it amounted to \$196,000. The past year is the only one which exceeded it in volume.

For two terms he had served as mayor of Palmyra and had held other offices of trust in the affairs of the community.

Buy Now to Avoid Shortage, Slogan of Seattle Dealers

Success of Season Depends on Outcome of Early Buying Campaign Recently Launched

SEATTLE, Feb. 26—Indications all point to a heavy demand for cars in western Washington this year, but whether the season on the whole is to be generally successful for dealers depends upon the success of the campaign recently launched in this section to encourage the public to "buy now" in order to avoid a shortage of cars when the motoring season reaches its peak.

Dealers of all lines of popular cars are virtually as one in expressing fears that there will be a car shortage this year unless the buying starts in a healthy manner at an early date and the manufacturers may be able to speed up production by anticipating the demand on the basis of orders placed by dealers.

The Seattle Motor Car Dealers' Association is encouraging the public to do its car buying now. In its latest message to the public the association says:

"There is no mystery about supply and demand in the automobile industry.

"As in all other industries—depletion of winter stocks and low production fore-shadows a certain shortage for 1921.

"The spring demand for cars is always heavy—this year it will be doubly so, with fewer cars to supply it.

"Production at the factories has been cut to a minimum—and here we are face to face with spring.

"The model, the make, the style, you desire. Yours to pick now—before the shortage comes.

"The laws of supply and demand are inevitable—wearing blinders will not help you when the shortage reaches Seattle."

School Adds Free Lectures on Mechanics and Electrical Work

Los Angeles, Feb. 25—The National Automotive School, established in 1902, has started a series of free evening lectures on automobile mechanics and electrical work. The school reports that the result has been amazing and that the requests for advanced electrical work were so numerous from the persons attending these lectures that an evening school in automobile electrical work for car owners and mechanics employed during the day was started. The enrollment includes service managers from some of the distributing agencies and many mechanics and car owners who are anxious to understand thoroughly the care and repair of their electrical equipment.

The evening school is confined to electrical work, including storage battery building, complete overhauling of starting motors, generators, armature work, coil, relay work, etc. The general repair shop of the school has noticed a considerable increase in electrical work since these classes were started.

Concerning Men You Know

John Zak, National dealer in Sacramento, has taken the agency for the Auburn there. Mr. Zak recently turned the Liberty over to the L. D. Allen Co. in Sacramento.

F. D. Lauppe of Sacramento, who recently took on the Lexington after releasing the Buick to the Sacramento Buick Sales Co., has added the Nash to his line, the Palmer-Arnold Co., having given up this car.

R. S. Torrance, formerly district manager of the Wisconsin-Minnesota Light & Power Co. at Eau Claire, Wis., has become associated with the Union Auto Co., in charge of its two sales and service buildings in Eau Claire and Chippewa Falls, Wis. A. J. Podawiltz continues as active head of the company, but will devote his attention to the sales department, representing the Buick and Cadillac. He will be assisted by O. L. Darwin and R. L. Jones.

Edward W. Kruspe, formerly with the Standard Motor Truck Co., has been appointed mid-west manager for sales of Acason trucks with headquarters at Chicago.

Jack Neely, assistant sales manager of the Barley Motor Car Co., Kalamazoo, Mich., for several years, has resigned his position and will be associated with the Studebaker Motor Car Co.

Dick Jemison, for the past year in charge of sales promotion at the Miller Rubber Co., has been appointed advertising and sales promotion manager of the Oldfield Tire Co. of Akron.

Guy Wyckoff, senior partner in the Bloomington, Ill., Auto Sales Co., has sold his interests to Walter Ritchie and will engage in other business. J. W. Wyckoff, junior member of the firm, remains and there will be no other change in the policy or management.

Fred Wellman, for two years advertising manager of the National Motor Car & Vehicle Corp., has resigned his position to join the National Motor Sales Co., of Chicago, distributors of National cars, in the capacity of sales manager.

A. W. Swain, for three years retail salesman in Philadelphia for the Willys-Overland distributor, has resigned to become general sales manager for the Liberty Mutual Insurance Co., Boston.

M. W. Ellis, vice-president and general manager of the Hart-Parr Co., Charles City, Iowa, has been elected a director of the Iowa Chamber of Commerce.

W. F. Taylor of New York City has been appointed director of Eastern sales for Acason trucks, with headquarters in New York. He will form his own factory sales organization to co-operate with what distributors he appoints in the eastern territory.

Glen D. Hiller, former sales manager of the Nelson Motor Truck Co. of Saginaw, Mich., has become assistant general manager in charge of sales and advertising of the Triangle Motor Truck Co., St. Johns, Mich.

E. R. Masters, formerly with the International Truck Co., has been appointed sales manager of the Walker-Johnson Truck Co., Woburn, Mass.

R. C. Ruddle has been appointed purchasing agent of the O. Armleder Co., Cincinnati, to succeed W. R. Hill.

Daniel G. Thorne, formerly with the Diamond T Motor Car Co. of Chicago, has been named national sales representative for the Republic Truck Sales Corp., Alma, Mich. Robert B. King will continue as eastern division sales manager.

T. B. Funk, the engineer who has been responsible for the recent engineering development of the Utilitor has been placed in charge of Utilitor sales, succeeding Fred E. Wilson, who will again become associated with the automobile industry.

T. B. Blakiston, formerly district manager for the southeast territory for the American Hammered Piston Ring Co. of Baltimore, has been promoted to district sales manager and will control the territory formerly under Mr. Blakiston's charge. A. M. Merrifield has been placed in charge of the western and Chicago sales districts succeeding D. T. Freyer.

Earl L. Woods, formerly sales manager of the J. I. Case Plow Co., Racine, Wis., has been elected a director and vice president in charge of the Kansas City territory of the Horse-Shoe Rubber Co., St. Louis and Kansas City. The other directors and officers of the company are L. N. Burns, president; Paul Bakewell, Jr., secretary; C. Bernet and W. F. Dunlap.

Edward P. Jester & Sons, Baltimore, have been appointed distributors for the Baltimore territory for the Mitchell car.

George J. Blanton, who for the past four years has been connected with the engineering sales department of the Chain Belt Co., Milwaukee, has been made New York district manager.

Fred R. Wilhelm, for many years with the Standard Parts Co., Cleveland, and its predecessor, the Standard Welding Co., in the financial and credit end of the business, has resigned from the company effective Feb. 15.

Percy T. Allen, formerly manager of the Madison branch of the B. F. Goodrich Rubber Co., and for the past year manager of the Milwaukee branch, has resigned to become associated with the Milwaukee-Oakland Co., Oakland dealer in Milwaukee county, as president and general manager. He succeeds Dwight Sullivan, who retires to join the Alfred Reece Co., Milwaukee, distributor of the Lafayette, as sales manager. Mr. Sullivan formerly was associated with Locomobile, Cadillac and Mercer in New York and Chicago.

F. E. Lauppe has taken over the agency of the Nash passenger cars and trucks, up to this time handled by the Palmer-Arnold Co., in the Sacramento, Calif., district, and will handle them in addition to the Lexington, which he took on when he relinquished the Buick line last Summer.

R. J. Firestone, whose connection with the rubber industry has made him well known throughout the entire country, has been elected a vice-president of the United States Motor Truck Co.

L. H. Amrine, chairman of the commercial car bureau of the St. Louis Automobile Manufacturers' and Dealers' Association, who organized the Scudder Motor Truck Co. in 1915, and was its vice-president and general manager, has joined the sales organization of the Dorris Motor Car Co.

company are: Robt. F. Carr, president of the Union Motor Car Co., president; vice presidents, W. J. Meyer, Memphis; S. B. Street, Columbus, Miss., and R. F. Moorehouse, Springfield, Mo. R. N. Phillips of Memphis is secretary and treasurer.

Open House in Boston For Big Annual Trade Opening

Boston, Feb. 24—Today, Washington's Birthday is the annual opening of the big motor trade and dealers all had open houses for the occasion. There were special features also.

One was the Cadillac so-called Recognition Day celebrated with much ceremony and a parade of Cadillac cars beginning with the 1902 Model A and showing at least one car of every model built by the company since its inception. Boy Scout buglers announced the coming of this unique cavalcade. The route was over the downtown business and financial districts.

Dodge Brothers' special feature was Victor Herbert, foremost of American composers. At the Henshaw Motor Co. music especially composed by him, in honor of Horace E. Dodge, was publicly played for the first time in Boston.

Lieut. Gov. Alvan T. Fuller, originator of the idea, also had his establishment visited by the many Packard owners. As usual the day was featured with decorations and music. A tour of inspection through the Packard plant was continued this year.

Pierce-Arrow Is Ready for Normal Production Schedule

Buffalo, N. Y., Feb. 23—Completion of the vast amount of work preliminary to the establishment of regular production schedules for its new passenger cars and truck models has been announced by the Pierce-Arrow Motor Car Co. Both passenger cars and trucks have been produced in a limited quantity during the last few months, the work of preparation for normal production progressing simultaneously.

The task of preparation having been accomplished, says Col. George W. Mixer, president, the company has effected a readjustment of its factory forces. About 500 who have been engaged in work of preparation are being laid off, but the bulk of the factory force, numbering more than 5,000 workers, will continue regular production.

OPENS LARGEST TRUCK STATION

Rochester, Feb. 24—The Holey-Selden Sales Co. has opened in Rochester the largest exclusive truck station in western New York. The floor area of the new station is 9,000 sq. ft. The latest machinery has been installed, thus permitting rapid service on all trucks at a minimum cost, while factory trained experts will do the work. The station will be operated under the supervision of the Telden Truck Corp.

Illinois Trades Will Hold State Convention at Peoria

Peoria, Ill., Feb. 24—The second annual state convention of the Illinois Automotive Trade Association will be held here March 21 and 22. The invitation for the meeting was extended by the Peoria Automobile and Accessories Association.

Speakers of state and national prominence will be brought to the convention. There will also be round table discussions. Convention sessions will be open to everyone engaged in the automotive business in Illinois, according to F. C. Zillman, manager of the association. Non-members are especially invited to

attend the convention and find out just what the state association is doing for their interests and along what lines its future activities will be directed.

TO MAKE NEW TRACTOR

Memphis, Tenn., Feb. 25—The Ideal Tractor-Cultivator Co., organized under the laws of Delaware with an authorized capital of \$1,000,000, will manufacture a newly patented farm tractor at Memphis, patented by R. L. Tolston, a Memphian. The new firm will be located at the plant of the North Memphis Machine Works on the Belt line. The machine works will continue as before this line being added. J. P. Stanton will continue as manager of the plant. Officers of the

Single Effort by Hartford Dealers Makes Better Show

Old Association Absorbs New and Stages Exhibit Unprecedented In its Success

HARTFORD, Conn., Feb. 26.—One fact brought home to the members of the Hartford Automobile Dealers' Association by the unprecedented success of the fourteenth annual show held here was the truth of the saying "In Union There Is Strength." That is the meat of the cocoon—organization, full accord and harmony. This was brought about by the present and older association absorbing the Automobile Trades Association of Hartford thus bringing all Hartford dealers together in one body.

The increased membership of the original association obviously makes that body stronger than ever and if there was a time when concerted dealer action was necessary it is right at this time when the state legislature is considering some eighty odd bills that directly affect their welfare. Furthermore, the increased membership of the association made it possible to stage a larger and better show than ever.

Contrasted with the situation a year back conditions today are most encouraging. Hartford dealers have effected a live wire organization working for the common good of the industry not only as regards sales and service but with the idea of promoting the buyer's welfare as well.

Spirit of Cooperation Manifest

Back of it all is an underlying spirit of cooperation and this was expressed forcibly at two luncheons given during show week, gatherings that reflected confidence to the fullest extent.

Ideal weather helped materially and from remote sections of the state came interested prospects and some buyers. And, while the price of admission this year was double that of 1920 there was not the slightest complaint. The public was never in a more receptive mood.

The 1921 show was a buying show and most of the dealers were able to account for some very good business. The accessory dealers, too, did very well. Trucks did not fare so well and it is not recorded that the two makes of tractors displayed set any new records.

Addressing the dealers in a noon day luncheon show week, Robbins B. Stoeckel, commissioner of motor vehicles, told the dealers something of the proposed laws: that requiring every driver and car in the state to be covered by insurance; those designed to increase the revenue in order that more funds may be available for road betterment and the bill calling for a tax of one cent a gallon on gasoline, such as is in force in Oregon; and others which affect the dealer.

The commissioner said that he appeared before the dealers in a triple capacity speaking as he did for the state highway commissioner, the tax commissioner and his own department. He emphasized the fact that money is

urgently needed for roads and that it will have to be raised through automobile taxation and disclaimed all intent on the part of the legislature to drive trucks off the road. The dealers, however, are well organized and are working to defeat legislation that will make it prohibitive to operate a 5-ton truck because of high license fees.

Is the Fire Department in Your City Motorized?

A CROSSE, Wis., Feb. 28.—The annual report of the fire department impressively illustrates the economy of motor-propelled over horse-drawn equipment. Three triple combination trucks now in service traveled 761 miles to respond to 298 alarms during 1920 at a total expense to the city of \$602.89. During the same period, 14 horses used by the department consumed feeding stuffs costing \$2,433.13, and the horseshoeing bill for the year amounted to \$683.90 additional. The recommendation that three additional trucks be purchased at once, supplanting nine horses, probably will be carried out without further delay because of this showing.

Referendum Vote for Officers Is Taken by Wisconsin Dealers

Milwaukee, Wis., Feb. 21.—Agreeable to action taken at the first annual meeting, held in connection with the annual Milwaukee show, Jan. 13 to 23, the Wisconsin Automotive Dealers' Association has filed articles as a non-stock corporation. The incorporators are three directors, namely, Charles W. Collier of Green Bay; Arthur F. Raab of Sheboygan, and A. H. Thom of Oshkosh, Wis. A referendum vote is now being taken for the election of permanent directors and when this is completed, the board will meet in Milwaukee, elect officers, and perfect the organization under its new charter.

The association was formed at a general meeting of Wisconsin dealers in Milwaukee last September, during the annual State Fair. It is modeled after the Milwaukee association, one of the oldest and best organized dealers' organizations in the United States. T. C. McMillan, Overland, Milwaukee, is serving as first president. Bert J. Ruddle, executive secretary of the Milwaukee association, is the secretary of the state association as well.

ALLEN PLANT REOPENS

Columbus, Feb. 21.—The receivers for the Allen Motor Co., of Columbus have opened the Columbus factory, which was closed down recently for inventory. Beginning Feb. 15 the plant opened with about 100 men employed. Orders for a large shipment of cars were received recently. The plant is being operated on about a 50 per cent basis.

Two Cars a Minute Are Sold by Government at Baltimore

Lowest Price Paid \$40—Sale Held Despite Protest Made by Trade Association

BALTIMORE, Feb. 23.—Officials of the government sold last week 2,100 motor cars of all kinds and in various conditions, despite a protest by the Baltimore Automobile Trade Association to the Federal authorities asking that the sale of used motor vehicles in large quantities be discontinued in this city.

No touring cars were offered, the models being light delivery cars, trucks and ambulances. A crowd that ran into thousands was on hand throughout the sale and the cars were sold at a very rapid rate. For a time the average was about two a minute.

Inspection of the cars by buyers was limited to a look under the hood and a moving of brakes and gears and any other exterior inspection possible, but no cars were permitted to be tested as far as operation was concerned.

Government officials stated the cars were serviceable, but did not come up to the specifications demanded by the government. All the vehicles that left Camp Holabird, were towed away.

Purchasers from Distant Parts

The cars being sold here are used motor vehicles gathered from the various motor camps of the United States. They are being sold under the authority of the Quartermaster General's office and officials of the Motor Transport Corps directed the sale. Buyers came from all over the country. It is estimated that the first days sales totaled \$200,000. The lowest price was \$40.

On the second day some of the big trucks brought as high as \$2,400.

Interests said to represent the General Motors Corp. and the Backus Motor Co. of East Orange, N. J., are reported to have purchased about \$20,000 worth of cars each.

Brigadier General A. E. Williams, assistant to the Quartermaster General, attended the sale and was accompanied by Colonel F. H. Pope, chief of the Motor Transport Corps and Lieutenant Colonel W. N. Haskell, assistant director of sales.

Practically none of these leave the grounds under their own power. About 300 freight cars of the B. & O. and Pennsylvania Railroad now are parked just outside the grounds ready to receive the cars for out of town shipment.

John C. O'Brien, general manager of the Baltimore Automobile Trade Association, said the association's members protested to the government because of the injustice of bringing motor vehicles from all over the country to be sold in this city. This, the dealers believe would have a serious effect on future business here. They sought to have the government sell the cars at the various Motor Transport Camps instead of bringing them to Baltimore.

A Department of BETTER BUSINESS

Conducted by Ray W. Sherman

Tell Public How Many Buyers Keep With You

Are you, Mr. Dealer, getting the utmost possible advertising value out of your customer's good will? A customer's good will can be made to be a mighty good advertising point. For instance, why not analyze a hundred patrons and see where your business comes from and then publish an advertisement reading about like this:

"WHEN WE CHECKED UP ON A HUNDRED PATRONS

"We found that sixty-seven of them were former patrons and twenty-three were sent to us by old customers—thus 90 per cent of our business had come from selling cars that satisfy and giving service that satisfies.

"Our cars and service have been this way for ten years—they satisfy."

The advertisement might then be made more specific by giving a list of anywhere from 10 to 100 patrons and specifying opposite each name just which were former patrons and which were brought to the establishment by former patrons.

Such an advertisement would prove very interesting to all local motorists and would give a new slant to the old proposition of selling cars and service that satisfy.

Use All the Material You Have on Hand

Many dealers seem to think the place to keep their merchandise is on the shelf. One dealer had an old Ford chassis, an unpainted speedster body, a set of wire wheels, a set of new tires, and a number of fixings on the shelf, in the stockroom and in the storehouse. A salesman got out this material and dolled up a classy speedster. In less than two weeks it was sold. In this case the car, all the extras and a paint job was disposed of in one sale.—S. E. Gibbs, Colfax, Ia.

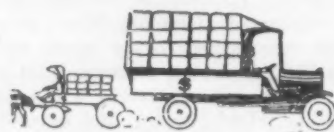
Experts Do the Job in This Station

Just as some citizens object to being shaved or having their hair cut by a "barber school" novice, certain motor car owners feel more comfortable if they are assured that repairs on their vehicles will not be made by automobile repair, or truck service school students,

Whether they are right or not, is a matter of individual opinion. But these objections are known to be raised. The Enterprise Auto Co., of Williamsport, Pa., advertises extensively that all repairing done in their shop is by experts and that they do not employ "apprentices or beginners; only real mechanics." They are drawing a good trade.

Loans Chassis While Making Repairs

Loaning a chassis and fitting the customer's truck body on it while his truck is being repaired is proving a good business wrinkle for the Superior Auto Repair Shop, Philadelphia. This has been found decidedly more advantageous than simply loaning another truck. The truck owner appreciates having his own body, especially if he is a merchant, or contractor whose name and address on the vehicle are a part of his advertising. Then, too, he knows the capacities and limitations of his own body and is "used to it." It is easier, too, for the repair company, which is always pretty sure to have several extra chassis, but less sure to have a suitable body.



Horse "cents" is all right—but it's dollars that count today

Who has a Horse?

When you see a horse-drawn delivery wagon you see a prospect for a light truck, at least.

You can't be expected to take the used horses in trade, nor those attached to the buggies of doctors, teachers, mail carriers and others who need passenger cars.

Make a census of the nags and show their owners that gasoline is better than oats.

Remembers His Customers at All Times

The Studebaker Sales Co. of Chicago continues to help Studebaker owners after it has sold them cars. Arrangements have been made by the company to have all owners of the cars in the city photographed for purposes of the identification cards required for automobile drivers under the new city ordinance. The company bears the expense of the photographing, according to a letter which H. R. Levy, the president, has sent out. Enclosed with the letter is a postal card for owners to fill out and return to the photographer who, in turn, will notify each individual regarding the time most convenient for an appointment.

125,862

Is there a real estate operation planned near you for the spring?

If there is, this is your grand chance to sell cars to the real estate operators. They need machines to take prospects from the railroad station or the end of the car line out to the new tract. Show them the expense, inconvenience and unpleasantness of renting buggies, taxicabs, or automobiles from the livery station, and the pleasure and profits from owning one or two or more cars of their own with which to carry the prospective purchasers.

And, of course, you can make an arrangement with the real estate men to get the names of all purchasers of property, for they also will need cars. Most real estate operations are not well provided with transportation facilities and the first residents will be practically dependent upon automobiles. Even the automobile dealer can make money in real estate!—General Motors Acceptance Corp.

Makes Profit from Old Windshield Glass

One dealer has netted about \$250 from windshields alone in a year. He picks up old glasses in junk yards and cuts them to fit the popular models of the day. Some times he buys the frames and fits up his new shields. Small pieces of glass are used to make classy windshields for speedsters and the very small pieces are fitted into the back curtains at a nice profit.—S. E. Gibbs, Colfax, Ia.

Advertises Flat Rates for Repairs

The United Garages, Philadelphia, have been doing a satisfactory business through emphasizing in their advertising a flat printed price-list of motor repairs. For instance, for grinding valves and cleaning carbon, the concern charges \$15; for taking up rod and crank bearings, \$20 and for installing rings, new piston pins, or bushings, \$15, making a total for virtually a complete overhaul for a six cylinder motor just \$50.

Expert Says Battery Grouping Important

"Separate your heavily constructed batteries and your light batteries," is the advice to shopmen of M. Elwell, superintendent at the Exide service station of the Electric Storage Battery Co., Philadelphia. "This will permit you to charge in proportion to the size of your battery. Keeping the sizes together is a great convenience in charging. And keep the polarities separated as far as possible."

What He Did to Sell Spark Plugs

To many drivers all spark plugs look alike. Many dealers are handling plugs that are claimed to produce ribbon-like flames and various other kinds of sparks. One dealer demonstrated a special plug beside an ordinary plug in a dark box set against the window. Signs above the box explained the exhibit. The plan caused more people to stop and look at his window than anything he had ever tried. No doubt it helped him in making the large sales he landed during the exhibit.—S. E. Gibbs, Colfax, Ia.

Novel Methods Cause Crowds to Stop

An Iowa dealer who was introducing a new type of plug made a wooden model that stood about three feet high. It was fitted up with large electrodes and painted nicely. He borrowed a high tension coil from the high school and connected it to the light circuit. The sparks jumping across the six-inch gap made considerable noise and never failed to stop all who passed the window after dark.—S. E. Gibbs, Colfax, Ia.

How Did the Car Work On a Week End Trip?

Satisfied owners are the best sort of testimonials for the dealer and the more times he can tell prospects about these satisfied owners the better. It will be for his business. And one of the best ways of telling about these satisfied owners is by means of newspaper ads. Folks will



"High atmosphere" is a big factor in business success

125,862

The time is past—or should be—when rented rigs carry real estate men and their prospects to "New Monia."

Now they take—or will if you'll sell them—closed cars to view the beauties of "Sedanville."

There are 125,862 Real Estate Operators. All may not be prospects for cars, but the only way to find all that are, is to canvass everybody.

read such ads because people are always interested in personalities about folks they know or fellow townspeople. So the dealer, realizing this situation, might on each Monday run a little ad headed: "How Local People Used their Cars, Purchased of A. B. Smith Auto Co., Over the Week End." Then under this heading the dealer might run some items reading like this:

"John Brown and family motored to Clear Lake Saturday noon and returned Sunday night. 'Not the least little bit of trouble going or coming. The car is a whiz!' says Mr. Brown."

"Mr. and Mrs. Andrew White and party of three friends motored to Chicago over the week end. 'Our car ran like a twenty-four jewel watch on this trip. That's the way it runs all the time!' smiled Mr. White today."

Such items as the foregoing could be very easily obtained by calling up some owners and asking them about their week-end doings. And such advertisements would not only flatter the present owners, but would give a wide circulation to the best sort of testimonials and do much to push the dealer's business.

A Blackboard to Keep 'Phone Call Record

The Pennell Auto Co., of Fort Wayne, Ind., dealers in Ford cars, has a very simple method of keeping its salesmen informed of 'phone calls, etc. In the salesmen's room the company has installed a blackboard and on this board all 'phone calls, etc., are chalked up. Then when the salesmen come in and take care of the calls or whatever it is that demands their attention, they erase the calls. In this way the board is always kept up to the minute and there is never any confusion about getting desired information to the salesmen.

Who Has a Horse?

Anyone who keeps a horse is a good prospect. It costs just about as much to drive a horse nowadays as it does to keep an automobile.

Every time you see a horse-drawn delivery wagon make a note of the name and address of the store. It may need a motor truck.

Every time you see a horse-drawn buggy on the road or attached to a hitching-post find out if you can who it belongs to. He or she ought to have an automobile. Horses aren't your competitors; they are cards in an index of live prospects.—General Motors Acceptance Corp.

"Buy a Car and Pick Wild Flowers"

Some dealers make a practice of keeping cut flowers in vases in their display rooms which, of course, is a mighty good thing. But why not vary this plan in the spring time by putting wild flowers and ferns on view in the display room and placing placards with them reading about like this:

"ONE OF THE JOYS OF MOTORING—
GATHERING WILD FLOWERS
IN SPRING

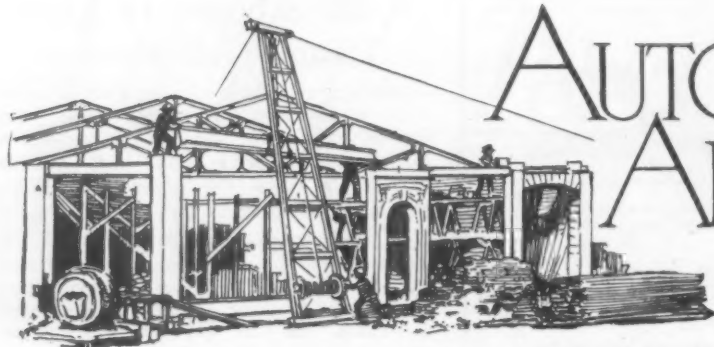
"These wild flowers were gathered yesterday by our Mr. J. H. Smith on the Brampton road, about nine miles out.

"Buy a car and get into the countryside this spring. Treat yourself to the time of your life."

Such a plan would prove particularly pleasing and interesting to all women who came to the show room.

An Idea that Makes Ideas Available Just When You Need Them

ARE you getting full value out of this "Better Business Department" by preserving and classifying all the suggestions contained in this department? Why not secure a little indexed note book and clip out these items from week to week and paste them in this book in sections headed "Selling Cars," "Selling Service," "Better Service Ideas," "Publicity and Advertising," etc.? Then when any particular end of your business needed a little boosting all that you would need to do would be to refer to the right section of the book and there find a number of ideas which would enable you to boost the department successfully. In this way all suggestions would be ready when needed and you would not have to rummage through back numbers to find the particular suggestion you had a hazy remembrance of. A clerk or stenographer could do this clipping and classifying in a few minutes of time each week.



AUTOMOTIVE ARCHITECTURE

Planning and Building Problems



CONDUCTED BY TOM WILDER

Two Store Buildings Converted Into Sales and Storage Building

NO. 313

I am soon to occupy with an automobile sales and accessory business, two store buildings. While the accessory vulcanizing and automobile sales business will be the main lines, I will have a repairshop where one or two mechanics will be employed and will want the remaining floor space arranged to store as many cars as possible. The driveway is in the rear of one of the buildings. Do you think it would be advisable to have a driveway from the front?

Kindly suggest size of each department and show a good location for ladies' toilet. This had not been arranged for and can be located in practically any part of the building second door from the corner.

Do you think it best to locate car display, accessory sales room, mechanics' work shop and vulcanizing department all in the building next to the corner and use the building on the corner for storage only?

In arranging the accessory showroom it is my intention to carry quite a large stock of tires and I have two 10 ft. floor show cases which I will use.—Oklahoma Dealer.

The two stores taken separately are too narrow for efficient storage so we suggest an arrangement something as shown, with the main entrance on the side street and an opening in the partition opposite. This gives an aisle across the building allowing storage on each side. While there is scant room for four cars in the width of each store it will be possible to place them there when necessary.

If you need more accessory storage space than we have shown, the stockroom may be extended to A. Ordinarily we should say the car display should occupy the preferred corner position but if you are going to concentrate on accessories as well as car sales an accessory display on the corner might do you as much or more good than a car display. Car entrances that are not absolutely necessary should not be considered as they are the greatest wasters of space and make good interior layouts difficult.

Repairshop Built to Make Possible Additions

NO. 314

I am contemplating the erection this spring of a one-story garage, possibly 50 by 100 ft. for general repair work. This is the largest size contemplated and we will probably build a smaller shop.

The information I desire is on general design, layout of doors, machinery, small lathe and grinder, work benches, storage room for oil, greases, etc., and any other information pertaining to garage layout in general.—Russell S. Mills, Highland Ave., So. Norwalk, Conn.

We judge from your letter that you intend to have a shop for repairing only, handling neither cars nor accessories. If this is the case, we believe it would be best to start at the rear of the lot and

Automotive Architecture

IN this department MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, service stations, garages, dealers' establishments, shops, filling stations, and in fact any buildings necessary to automotive activity.

When making requests for assistance please see that we have all the data necessary to an intelligent handling of the job. Among other things we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated, and how large it is expected they will be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

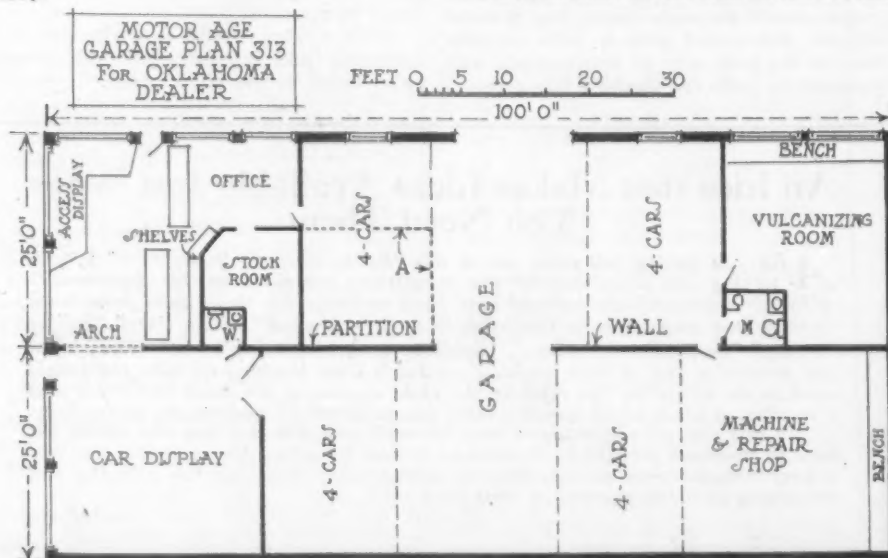
And how much of an accessory department is anticipated.

build forward something as we have shown, then the shop would be undisturbed by changes made in the front during expansion.

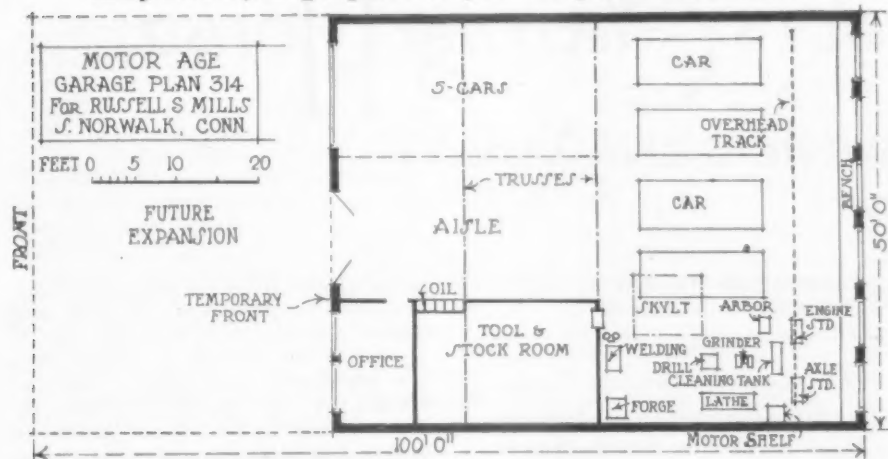
Another reason for starting at the back would be that in case you decide later to take on the agency for some car you can build the front with that in view instead of being obliged to alter the front after it is built for some other purpose. Double swing doors would be as good as any for this building.

We have no decided preference for any particular system of handling oil and grease, the main idea being to have the oil handy to supply customers. If it is desired to keep the expense down, some of the gravity systems described at various times in MOTOR AGE will answer nicely. The barrels may be hoisted to an overhead position in the stockroom and the faucets located near the office as indicated.

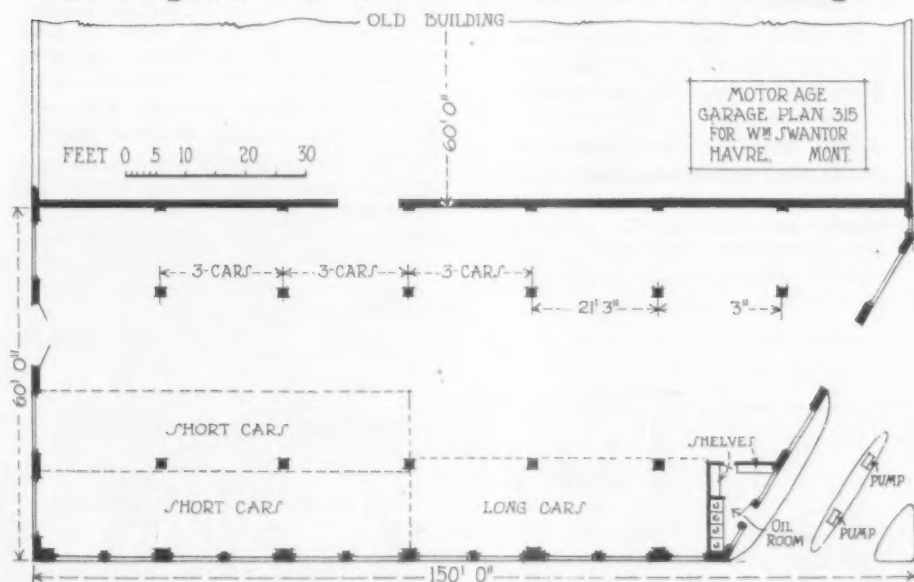
We would advise trussing the roof as that would make internal changes easier later.



Layout of Equipment for Repair Business



Storing Cars Between Posts to Best Advantage



Addition for Storage

NO. 315

We have a garage already built and want to make an addition. The old garage has steel trusses. We want to build so that a story could be added to this part if ever needed. We intend to build the walls of brick and tile. We only intend using this part for storage. We want your idea on the roof, whether it be for one story temporarily or permanently in case we never put up the other story. We don't want any posts in the way, as we want to get all the space possible.—Wm. Swanton, Havre, Mont.

There are two ways of going about your building to prepare for a second story later, one is to build with posts at first and make the second floor a temporary roof; the other is to build your trussed roof over the first floor without posts and later raise it bodily when you build the second floor.

If you are sure that you will later add the other floor, we would consider the first method best. Since you do not make arrangements for footings and posts the floor will have to be torn up and practically wrecked causing much extra expense at the time the addition is made. If you build the first floor as it is to be,

business can go on as usual while the building operations are in progress.

A plan such as we show will not give you much trouble from posts. They are placed at about car length from the wall and spaced so that three cars may be parked between each two. The wide open space of nearly 30 ft. in the center can be spanned by L beams and insures plenty of post-free space for turning, etc.

Sixteen-Valve Engine Head for Dodge

The Laurel Motors Corp., Anderson, Ind., have designed and placed on the market a 16 valve cylinder head of the round combustion chamber type for the Dodge engine. The intake manifold is of seamless brass tubing and designed to accommodate any 1 1/4 in. carbureter with S. A. E. standard flange. The gas passages are short and direct to the combustion chamber, and these passages are so designed that each cylinder gets an equal amount of gas. It is hot spotted through direct metal contact with the exhaust manifold—the exhaust arrangement being similar on the Dodge as that

which is now used on the standard type B Ford.

Priming cups give direct priming to intake gas passages and also can be used for vacuum tank connections. The exhaust gases are carried direct to the expansion manifold—there being no winding passages, therefore reducing the opportunity for back pressure. Connection is made with the regular Dodge exhaust by special exhaust pipe connecting with the cylinder head exhaust manifold.

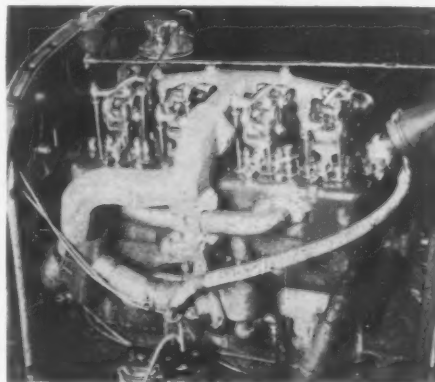
The intake passages in cylinder head are of sufficient area to take care of the volume from a 1 1/4 in. carbureter, and the exhaust ports are of ample size to quickly convey all burnt gases regardless of the speed of the engine.

The head carries 1 1/2 in. valves and the increase in valve area over the standard Dodge engine is 2.706 sq. in. as compared with 1.917 sq. in. The valves are actuated from the standard Dodge camshaft.

AMPLE WATER JACKET SPACE IN CYLINDER HEAD

Realizing that the maximum of efficiency can only be obtained through proper cooling great care has been taken to provide ample water jacket space in the cylinder head. Each exhaust valve has a separate port and there is a separate water passage to each port insuring proper cooling to the valves. The spark plugs are located on the exhaust side being 7/8 in. A. L. A. M. standard and the same sized plugs which are now used in the Dodge engines. The plugs being set in recesses have their points flush with the edge of combustion chamber and no extension plugs are necessary. A special cylinder head valve gasket goes with each head and no machine work of any character is required.

The equipment consists of the cylinder head complete with rocker arm assembly, push rods and all the operating parts, hot spotted intake manifold and exhaust manifold and connections, special cylinder head gasket ignition wires all encased in metallic tubing and ready for attachment, complete set of spark plugs, special type Wheeler-Schebler carbureter with special gas and air controls to give the greatest flexibility.



Laurel Motors Corp. sixteen-valve engine head installed in Dodge Brothers car

The Readers' Clearing House

Questions and Answers

Tightening Starter Chain

Q—How is the starter chain tightened on a Dodge car?—Obe Law, Indianola, Iowa.

Since we do not know what Dodge car you have we shall outline the adjustment of the driving chain for the Model G starter-generator. Due to the gradual wear of the starter-generator driving chain, a slight readjustment of its tension becomes necessary from time to time according to the service to which it is subjected. Since the tension of the chain is determined by the exact position occupied by the starter-generator in its supports, the starter-generator has to be moved each time it is necessary to change the tension of the chain.

A chain will give the best service when it is adjusted to such a degree that the portions midway between the two sprockets are just slack enough to permit of an up and down play of approximately $\frac{1}{2}$ in. If tighter than this, it will wear with undue rapidity, and will usually make an unpleasant humming noise while running. A chain looser than this, on the other hand, will be liable to injury from thrashing, and will likewise be noisy in operation. Whenever it is necessary to readjust the tension on the chain for a Model G starter-generator the following method of shifting the position of the starter-generator should ordinarily be carried out.

The chain inspection cover should first be removed. The castellated nut on the starter-generator sprocket-end bearing-extension should be backed off one or two turns, and the set-screw on the edge of the front flange of the cylinder-block should be unscrewed until the eccentric ring in the flange is free to turn. After this the starter-generator clamping strap should be released enough to allow the starter-generator to turn in its supports, and then the V-block back of the starter-generator should be screwed apart, if necessary, to allow the starter-generator

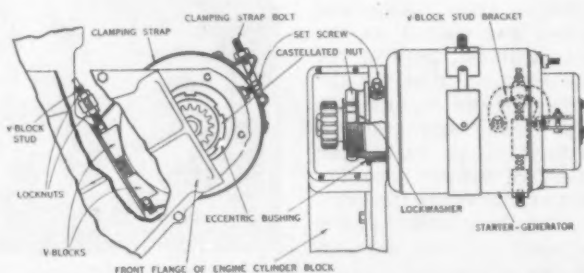


Fig. 1—Illustrating the manner in which the generator drive chain on a Dodge car may be adjusted. The adjustment of the chain is made by turning the eccentric ring or bushing. The slack in the chain should permit of an up and down movement of the chain of $\frac{1}{2}$ in.

CONDUCTED BY ROY E. BERG

Technical Editor, Motor Age.

The Readers' Clearing House

THIS department is conducted to assist Dealers, Service Stations, Garagemen and their Mechanics in the solution of their repair and service problems.

In addressing this department readers are requested to give the firm name and address. Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been asked by some one else and these are answered by reference to previous issues. MOTOR AGE reserves the right to answer the query by personal letter or through these columns.

far as needed, to obtain the proper degree of tension on the chain. As soon as the correct adjustment is obtained here the eccentric ring should be locked in its new position by tightening the set-screw again, and the starter-generator then drawn firmly against the cylinder-block flange by screwing up the castellated nut on the bearing-extension.

The V-blocks are next to be brought up against the body of the starter-generator so that they just begin to press against it, but do not force it out of its normal position. This adjustment of the V-block must always be made with great care, because serious damage may be caused if an undue strain is placed upon the armature shaft or the chain and sprockets by allowing the V-blocks to force the starter-generator out of alignment with the engine crankshaft. Such a strain may be produced either by crowding the V-block against the machine too hard, or on the other hand by

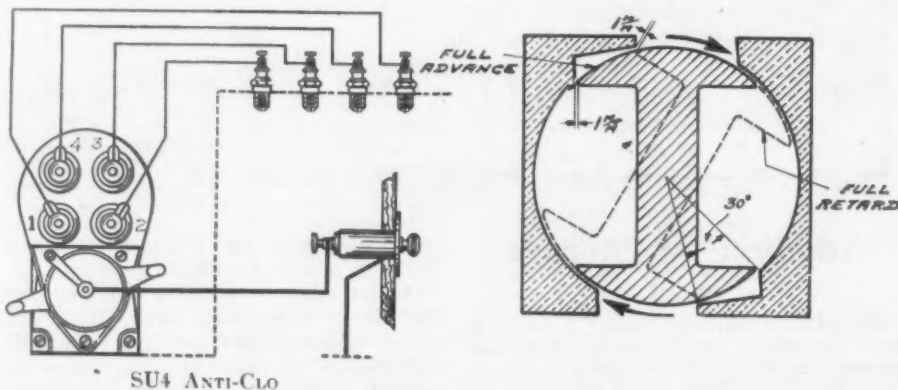


Fig. 2—The wiring connections of a Simms high tension magneto. The correct position of the armature of the magneto with reference to the pole pieces is shown to the right of the diagram

to come nearer the cylinder-block.

The eccentric ring should now be turned in one direction or the other as

failing to bring them up into actual contact with it, in which case the machine will be drawn out of position as soon as the clamping strap is tightened. Finally after the V-blocks have been correctly adjusted, the clamping strap should be tightened to lock the starter-generator securely in position, and then the chain inspection cover put back in place.

If the foregoing adjustment has been made properly, the chain will run without appreciable noise, and except for an occasional inspection will require no further attention until natural wear has made another readjustment necessary. The lubrication of the chain is taken care of at all times by the free oil in the timing-gear case.

Adjustment of No. 3 Stromberg Carbureter

Q—Give the adjustment of a Stromberg carbureter Model H No. 3 used on the 1920 Stutz car.—Boyd Young, Mansfield, Ohio.

The float level adjustment and air valve spring adjustment are located at the factory. However, if the engine is overhauled there will undoubtedly be a change of compression and it will be necessary to readjust the carbureter. By turning the air valve to the right it will take up on the spring which means that it will be a little harder to open the valve and consequently the mixture will be richer. Turning the valve to the left will lengthen the spring and the mixture will get leaner. As to other adjustments there are only two provided.

A, the low speed, which is a needle valve seating in an open nozzle, the opening of which is usually two sizes larger than is ordinarily necessary, permits an increase in the gasoline flow to that extent or can be shut off entirely. This governs the mixture at speeds from

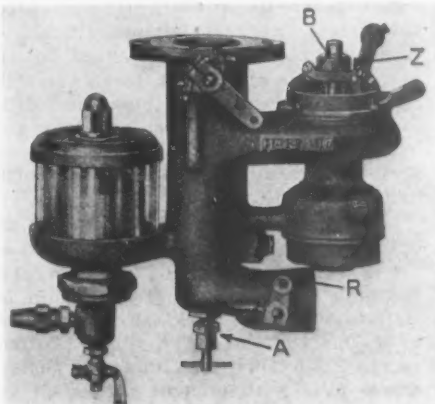


Fig. 3—The Stromberg carbureter model H-No. 3 shown above is used on the Stutz car. Its manner of adjustment is explained with the aid of the characters shown

idle to 15 m.p.h. The needle should ordinarily be between $2\frac{1}{2}$ and 3 turns open. The other adjustment is the high speed, B, which controls the position of the high speed needle. Before starting the engine open all pet cocks on the carbureter so that the inrush of gasoline will clean out any dirt which might have gotten in the carbureter in packing or otherwise. Also, be sure the rocker arm of the dash adjustment on the carbureter is not in contact with the roller above it, at Z when ADJ button of dash control is all the way down.

Also, before starting the engine, be sure the rocker arm of the dash adjustment on the carbureter is not in contact with the collar above it at Z when steering post control is all the way down.

To start the engine, raise the steering post control to its highest position, thus producing an extra rich mixture. In cold weather it also may be necessary to close the air supply in the hot air horn by means of a rod connected to R. This should be opened as soon as engine starts. Gradually lower the steering

post control as the engine warms up, and be sure same is in its lowest position and that the engine is thoroughly warm before adjusting the carbureter.

The mixture at low speed is controlled by the needle valve. If too rich, as indicated by the motor "rolling" or "loading," turn A, Fig. 3, up or anti-clockwise, thus admitting less gasoline and making the mixture leaner. If the mixture is too lean turn A down or clockwise, thus admitting more gasoline and making the mixture richer. After making proper adjustment on the low speed jet turn high speed nut, B, down (clockwise) as far as it will go, then open the throttle about one-third to a position corresponding to 25 m.p.h. speed on the level road and unscrew (counter clockwise) nut B until the engine runs smoothly and at the fastest speed that can be obtained for that throttle position.

Check this adjustment by opening the throttle quickly from different positions to see whether adjustment allows flexibility. If engine does not respond promptly to throttle opening give more gas by unscrewing nut B a few notches more. If, with the proper adjustment for 25 m.p.h. the mixture is too lean at extremely high speeds a higher number needle should be used. If too rich a lower number, with lesser taper, is required.

PISTON OFFSET

Q—Explain how to install pistons in the Buick D 45 with reference to the offset in the piston pin.—C. W. Wright, Hyshorn, Mont.

Buick sets the piston slightly to one side as shown in Fig. 4. The reason for the offset is to compensate for the reaction of the side thrust of the piston during the explosion stroke. When the piston is part way down on its power stroke all of the power or pressure on the piston is transmitted to the connecting rod at an angle, which reacts against the piston wall in proportion to the angle at that moment, mounting to a maximum at 45 deg. The greater portion of this area is below the wrist pin, so by placing the largest area on the left side, the tendency is to tip the piston against the side thrust pressure and thus give a better equalized pressure.

STARTER FAILS

Q—The starting motor on a 1920 Dodge does not seem to have power enough to turn the engine over when it is cold. The battery has been overhauled and recharged but the trouble still exists. What is the cause and how can this action be overcome?—L. W. Frutiger, Cedar, Kan.

There are two very logical possibilities for the trouble, poor brush contact or a faulty starting switch. Examine the commutator and if found dirty clean it thoroughly with a little very fine sandpaper. See that the brushes are clean and making good contact. Be sure and note the condition of the mica in the commutator as high mica will prevent the brushes from seating properly. The combined starting switch and reverse

current cutout is attached to the toe board. The starting switch is operated by a plunger pedal which extends through the top of the switch case. The switch is always held open by a strong spring while not in use.

Whenever the plunger pedal is depressed it closes the switch and thus allows the current to flow from the battery to the starting generator. When operating the switch make sure to depress the pedal the full length of its stroke; also note that the pedal rises at once to its normal position as soon as the foot pressure has been removed. Because of the way in which the sparking pedal operates we believe it would be advisable to examine the entire mechanism to see that the switch is making good contact. Check the wiring carefully to see that all connections are tight. In spite of the fact that the battery has been overhauled and recharged there is a possibility that the cells are in such poor condition that the battery will not hold its charge.

SIMMS MAGNETO

Q—Publish wiring diagram of the Simms high tension magneto.—Walter H. Ewend, Peru, Ill.

The wiring diagram of the Simms magneto is shown in Fig. 2. The magnetoes are made to run in only one direction as shown by the arrow engraved on the cap of the distributor.

If a poor spark is being obtained it is advisable to see that the breaker points are properly adjusted and clean. If the magnets have been removed they may have been replaced with the like poles on the same side, that is the N poles on one

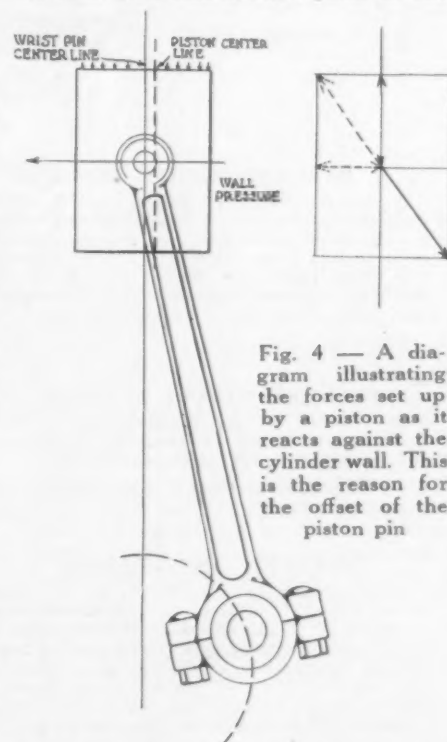


Fig. 4 — A diagram illustrating the forces set up by a piston as it reacts against the cylinder wall. This is the reason for the offset of the piston pin

side and the S poles on the other. This may be the reason for a poor spark.

Fig. 2 shows an end view of the pole pieces and field frame of a Simms magneto indicating the position of the armature when the spark occurs.

Wiring Diagram 1916 Hudson 6-40

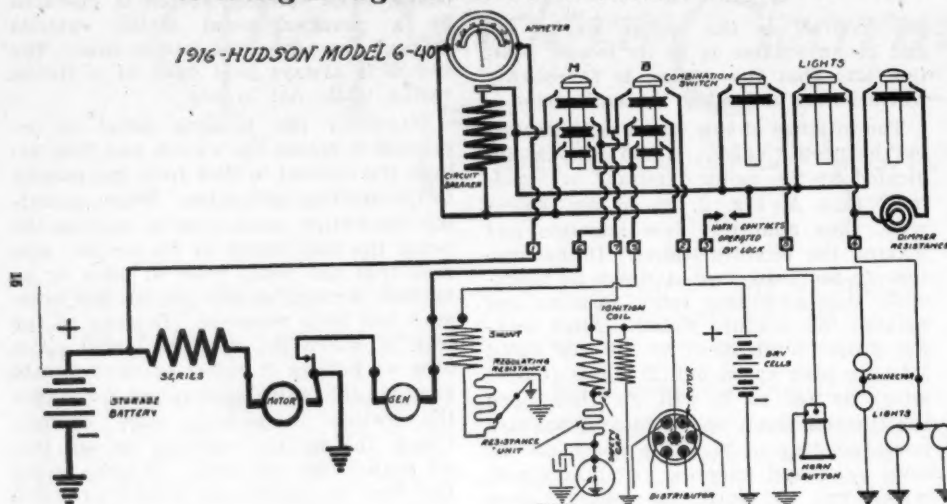


Fig. 5

Wiring Diagram 1915 Grant Model T

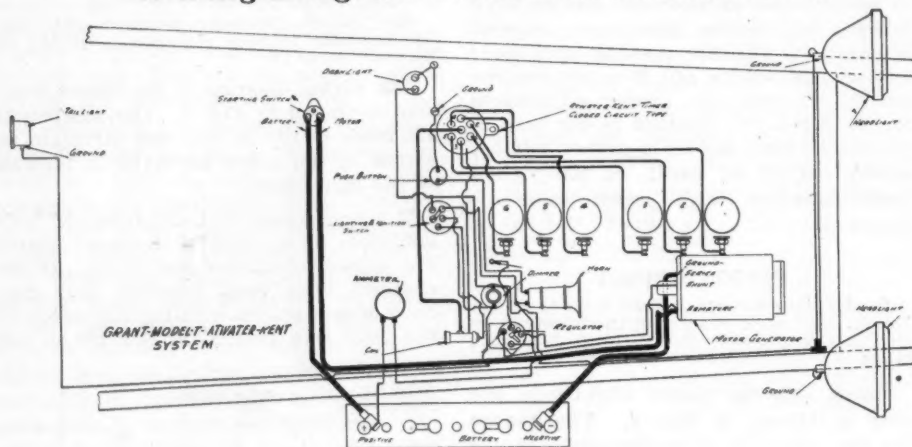


Fig. 6

OAKLAND WIRING DIAGRAM

Q—Publish wiring diagram of a 1913 Oakland, model 42. It has a Delco starter generator from which the starter transmission has been taken off. I am replacing these parts and would like to know how to connect same.—Peter Johnson, Ajo, Ariz.

See Fig. 9.

PULLMAN WIRING DIAGRAM

Q—Publish wiring diagram of a 1916 Pullman car using an Appel 12 V system.—Thomas Divelins, Indianapolis, Ind.

1—Wiring diagram of 1916 Pullman is shown in Fig. 8.

AMMETER INSTALLATION

Q—An ammeter installed on a 1915 Grant model T fluctuates at low speeds but steadies at high speeds. The regulator sparks when the engine is running at low speeds. Publish a wiring diagram showing connections for the ammeter installation and explain the cause for the sparking at the regulator points.

A wiring diagram showing the proper connections for the ammeter is shown in Fig. 6. We advise checking the wiring carefully according to the diagram shown. It is very important to see that the wire leading from the regulator field post to the generator binding post is in

perfect order as otherwise regulator trouble will surely occur.

CLUTCH TROUBLES

Q—The Borg & Beck clutch used on a Stephens car which has only been run about 1000 miles has developed a knock when the engine is running and the clutch is engaged. The knock stops when the clutch is thrown out. Give cause and remedy for trouble.

2—The Borg & Beck clutch installed in a Stephens car which has been run about 15,000 miles has a clatter when the clutch is thrown out. How can the trouble be remedied?—L. M. Seeman, Whittier, Calif.

1 & 2—It must be expected that a failure of lubrication or haste in assembling the car may result in difficulties that should be remedied. The following is an outline of clutch troubles that may occur: Slipping is a bad condition that may ruin friction rings, drive disc, bearing, sleeve, in fact the whole clutch if allowed to continue. It is usually caused by a continual pedal pressure on the under side of the floor board which holds the clutch partially "out." (To correct), adjust the clutch by moving the two adjustment bolts. If slipping comes from too loose an adjustment of the clutch, the same remedy will correct it.

Dragging, which makes gear shifting difficult, comes from the failure of the clutch to release properly and so allows the drive disc on stem gear shaft to come to rest. It may come from two principal causes: Too tight an adjustment of the clutch, or failure of clutch brake action. When thrown completely "out" the flange nut of the clutch throw-out sleeve is brought up against the brake facing on the hub of the flywheel housing. If that brake facing is allowed to become covered with oil or grease it will not stop the rotation of the sleeve and causes dragging. (To correct). Wash off the brake facing with a little gasoline.

Grabbing or stuttering causes the car to jump and shake as the clutch is let in and shows uneven gripping of the friction or drive disc by the asbestos friction rings. It has been found that nearly always this is caused by imperfect alignment of the clutch in installing. (To correct). Take the clutch down and secure proper alignment of stem gear shaft. If the grabbing comes from a warped drive disc caused by overheating from slipping, it will be necessary to replace the drive disc and friction rings. At times, grabbing may be caused by the accumulation of dirt or foreign matter on the asbestos friction rings and drive disc. (To correct). Wash out the clutch by cleaning clutch with kerosene as described. Do not fail to oil clutch after using kerosene.

Noise may develop at the three points on the thrust ring where it is driven by the dowel pins in the flywheel, because the pins were not properly fitted in installation and the backlash causes wear in the slots of the thrust ring. (To correct). Take down the clutch and replace dowel pins with pins of proper fit for thrust ring slots.

Improper lubrication will cause the retractor collar bearing or the throw-out bearing to become noisy. (To correct). Open up oil holes in stem gear shaft, replacing bearings if worn. These bearings may also become noisy if the bearing seat on the clutch sleeve is allowed to get out of line or if the stem gear shaft is out of line. This sometimes occurs from hasty installation or from bad alignment of the throw-out yoke. (To correct). Bearings should be straightened on sleeve and the clutch pedal yoke should be set to bear evenly on the throw-out bearing.

To adjust the clutch, first release same by pressing the clutch pedal. Refer to Fig. 7. Loosen both slotbolts "A" and move either of them to the right or "clockwise," above $\frac{1}{2}$ in. Let in clutch and if the adjustment distance "B," that is, the distance from the clutch cover plate to the end of the sleeve, is more than it should be, throw out again and tap either slot-bolt back "counter-clockwise" far enough to get the correct adjustment distance.

The adjustment "A" also adjusts the foot pedal. When the clutch slips it is usually due to the clutch pedal striking the under side of the floor board. Moving the adjustment bolts to the right automatically lowers the clutch pedal, giving the necessary pedal clearance.

When the bolts "A" reach the end of the cover slots, due to repeated adjustments, screw them out of their mounting holes and set them back into repeat holes exposed near opposite end of slots.

If for any reason the clutch is to be taken apart, first punch remounting "line-up" marks on cover and flywheel as the clutch will not work properly if it is shifted in remounting.

In taking the clutch apart, first depress clutch pedal and "lock out" the clutch spring by putting a space block about 3 in. high and 4 in. long between the cover and the throw-out yoke at "E."

Leave asbestos rings loose in their seats. When assembling, the two asbestos rings should be coated lightly on all sides with cylinder oil. About every thousand miles remove adjusting bolt and "squirt" a little cylinder oil into the clutch, just enough to moisten the asbestos rings. Too much oil will cause the clutch to slip until the oil is burned out.

It is sometimes desirable to clean the clutch by pouring about one-half pint of kerosene into it through adjustment bolt hole and allowing the engine to run 15 minutes, engaging and disengaging the clutch as it runs. The surplus kerosene can be drained from the clutch by letting the car stand overnight with the front wheels higher than the rear.

Do not slip clutch excessively instead of shifting gears. Slipping it makes the clutch do all the work that the transmission was designed to do. Do not drive with foot on the clutch pedal. It puts a constant pressure on the throw-out bearing and shortens its life.

Keep the clutch properly adjusted.

DELCO SAFETY GAP

Q—Publish illustration showing location of the safety gap in the Hudson Delco system. — J. W. Graizkowski, St. Paul, Minn.

The system used on the 1916 Hudson 6-40 car included ignition coil No. 2116 with the safety gap installed on the side of this particular coil. It is the only

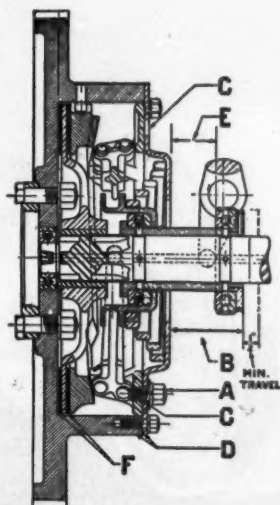
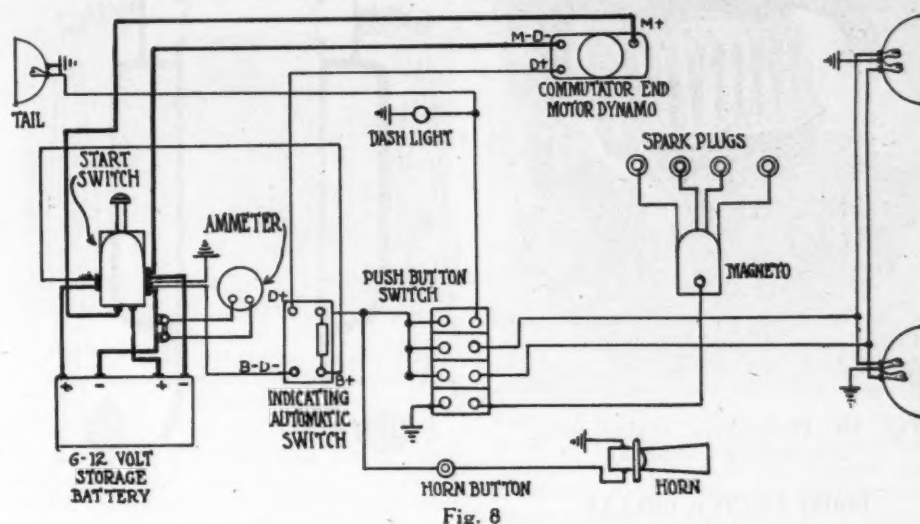


Fig. 7—Cross section of Borg and Beck clutch showing points of adjustment

Wiring of 1916 Pullman—Splitdorf-Apelco System



Oakland 1913 Wiring Diagram

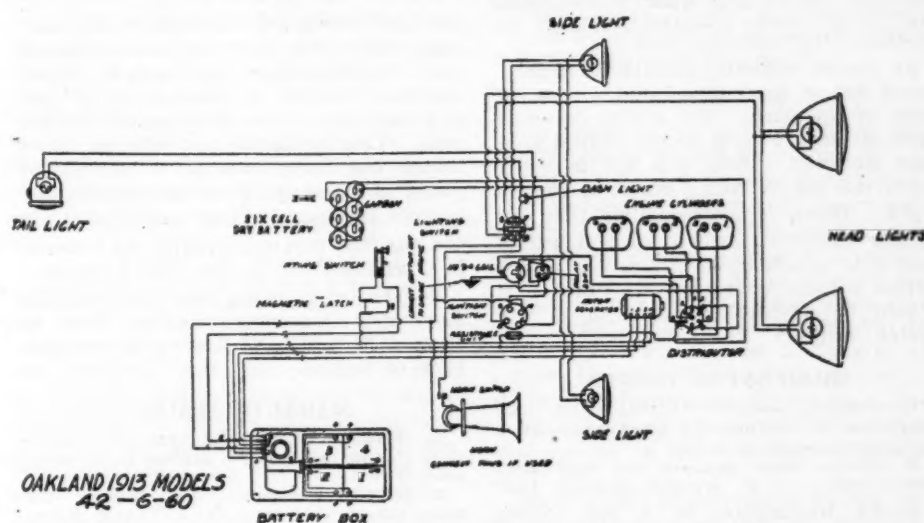


Fig. 9

Delco ignition coil that is provided with a safety spark gap. A circuit diagram of the Delco system mentioned is shown in Fig. 5. When you realize that the strength of the primary current in a battery ignition system is more or less constant strength it follows that the strength of the secondary current must also be more or less constant. In a magneto system, the faster the magneto armature is driven up to a certain limit the stronger the voltage in the secondary circuit becomes, so that a safety gap in such a system is essential.

CHATTERING CLUTCH

Q—What can be done with a Mack 5 ton clutch to stop it from grabbing with a chattering effect while starting before clutch is fully engaged?—Mitchell D., Waterbury, Conn.

1—The chattering is probably due to poor clutch adjustment. The clutch is of the dry-multiple-disk type, comprising six disks, faced on each side with asbestos fabric, and six steel driving disks. These are driven by teeth on the hub and casing, respectively, of the clutch. There are two springs, one within the

other enclosed within the hub and adjustable by the three nuts at the back of the clutch. There is a clutch brake to facilitate gear shifting by stopping the spinning of the shaft when the clutch is released. This is also adjustable for pedal position. We believe that the chattering to which you refer is a result of uneven pressure on the disks due to one of the adjusting nuts having been turned more than the others. If this is the case it is advisable to remove the clutch and unscrew all three bolts until their threaded ends are flush and then make a readjustment. Before this is done, it would be advisable to turn up the bolts as the trouble may be caused by a slipping clutch.

Remove the hand hole cover and turn each of the three drum bolts one-half turn to the right. A click will indicate a half turn. There is a possibility that the chattering is in the universal joints. The worm drive models have three universal joints in order to avoid excessive free shafting length which would cause whipping of the shaft. We advise checking the alignment of the shaft and the condition of the universal joints.

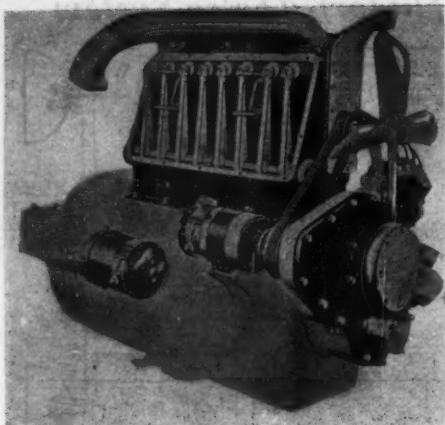


Fig. 10—Duesenberg engine using side valve construction

LOOSE CLUTCH COLLAR

Q—On an Oldsmobile 37 the clutch collar becomes loose though it has been tightened several times. Car has been driven about 13,000 miles and the only part that shows any wear in the drive shaft is the back universal joint.—E. O. Shidaker, Harveysburg, Ohio.

No clutch difficulty should be experienced unless there is excessive wear of some of the parts. The clutch collar is held in place with a wedge shaped support nut and unless this nut is badly worn the clutch collar ought to remain tight. There is a possibility that the clutch leather is worn to such an extent that it is impossible to get proper clutch action without continual adjustment. It would be advisable to put in a new clutch leather.

HORIZONTAL VALVES

Q—Publish suitable information and diagrams to explain the mechanism of a horizontal valve of a car.

2—Advise what engines use the horizontal valve.—I. H. Wright, Elwood, Ind.

1—An illustration of a side valve engine is shown in Fig. 11. The side valves as used in this type of engine is an adaptation peculiar to the Duesenberg engines, in which long side rods

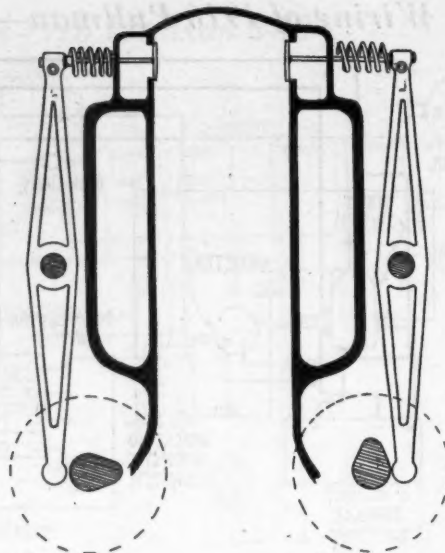


Fig. 11—Diagrammatic sketch showing operation of valves by side arm construction

are used which are vibrated by the camshaft below. The side rods are fabricated very cleverly from lightweight metal and their weight is about equal to that of a combined tappet push rod and rocker arm. This principle you are no doubt aware has been used for a number of years in Duesenberg racing engines and is very successful. This principle is not the one that was employed in the Duesenberg engines run in last year's races.

2—The cars using the four-cylinder Rochester Duesenberg engine, such as Revere, Roamer, and Kenworthy use this type of engine.

MAGNETO TIMING

Q—Publish wiring diagram of a Maxwell 25 touring using a Simms H. T. magneto.

2—Give instructions for timing the magneto on this car.—W. J. Young, Rose-dale, Kans.

1—The wiring diagram of a Maxwell 25 is shown in Fig. 14.

2—To time the magneto turn the en-

gine over until No. 1 piston is $1/32$ in. past top dead center, or $1/4$ in. past on the flywheel, on compression or firing stroke. Remove the dust cover, the commutator, and also the distributor which is held in place by means of two spring clips, and turn the armature shaft until the distributor brush is brought into position, viz., opposite No. 1 segment. Retard the contact breaker and move the armature, either to the right or left, as occasion requires, until the platinum points just break, or in other words, just separate. With the magneto in this position couple it to the engine (top dead center on compression stroke), and connect the remaining terminals up in the proper firing order of the engine. Exercise care in connecting the terminals, making sure that they are tight and secure, and do not allow any of the high tension cables to rub or chafe on any metallic part of engine or car.

REMOVING NASH UNIVERSALS

Q—Explain how to remove the universal joints on the 1919 Nash car.—M. A. Carpenter, North Syracuse, N. Y.

The first operation necessary is to remove the six universal joints to companion flange, nuts, lock washers, and bolts. Slide the propeller shaft to the front relieving it from the companion flange and slide it out of the front universal joint. Remove the six universal joint companion flanges, brake drum, hub, nuts, lock washer, and bolts and remove the front universal joint. To reassemble the universal joints and propeller shaft to the rear axle and transmission, it is necessary to attach the universal joint slip end to the universal joint companion flange and brake drum hub first.

Then slide propeller shaft into the front joint and line up the permanent end of the universal joint with the rear axle pinion shaft companion flange. In making these connections be sure that all joints to companion flange and bolts are tight and that all lock washers are in the proper position. Tighten the nuts securely to eliminate any looseness.

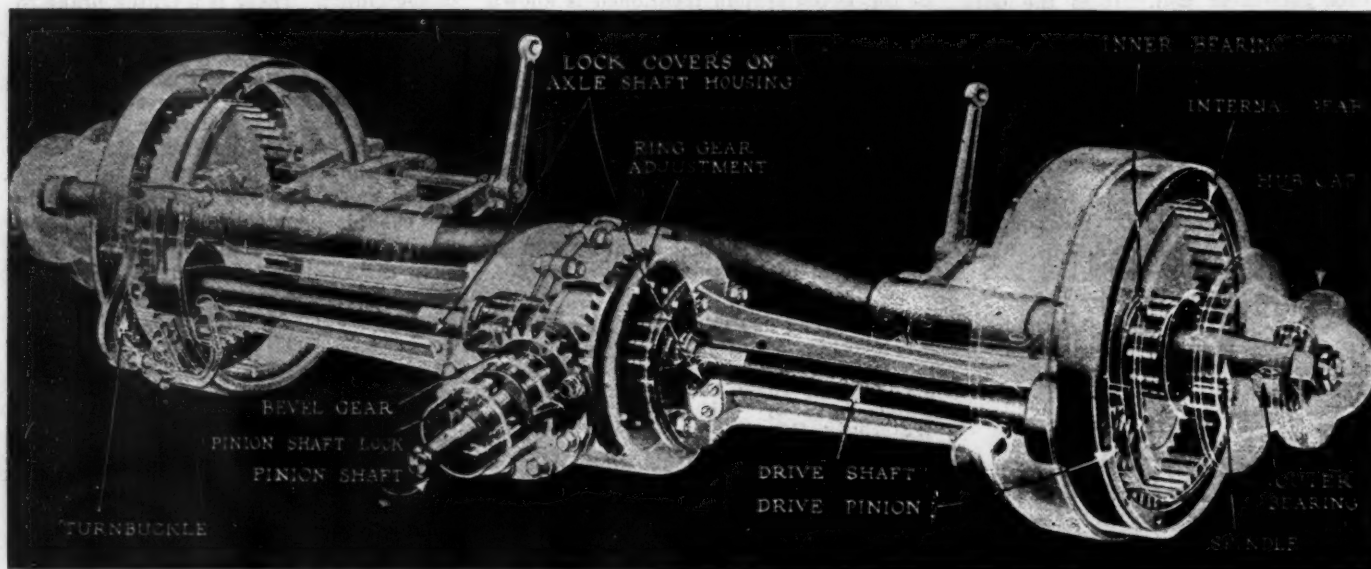


Fig. 12—This phantom view shows what the Clark axle looks like on the inside. Note the means for adjusting the pinion shaft bearings and the ring gear in the differential

Adjustment of Ball & Ball Carbureter

Q—Give address of the Ball & Ball Carburetor Co.

2—Publish cross-sectional view of this carburetor and give the adjustment.—M. A. De Maria, Chicago.

1—The Penberthy Injector Co., 346 Holden Ave., Detroit, manufacture the Ball & Ball carburetor.

2—A view of the Ball & Ball carburetor as used on the 1918 Oldsmobile is shown in Fig. 13. The adjustments for this carburetor are all taken care of at the carburetor factory. Fixed nozzles are used which should not be tampered with or changed. As can be seen by referring to the sectional view, 1 is the hot air passage of the primary carburetor containing the choke valve 2. Three is the primary ventura throat connecting the hot air passage with the mixing chamber 6, as shown by dotted lines and containing the gasoline jet 4. Five is another fixed air regulating orifice connecting the hot air passage 1 with the mixing chamber 6, and provided with a spring-opposed idling valve 7 arranged to control the air when small quantities only are being used. Eight is a throttle valve of the usual type.

Referring again to the same sectional view, 9 is an air passage leading from the external air to the mixing chamber, and it contains the butterfly valve 10, arranged to control the flow of air through this passage. Eleven is a gasoline jet arranged to discharge gasoline into the passage 9, when the valve 10 is opened, causing the gasoline jet 11 to be acted on by the suction of the mixing chamber 6. The air passage 9, with the gasoline jet 11, constitutes the second stage which is brought into action by opening the butterfly valve 10.

A connection between the butterfly valve 10 and the throttle valve 8 (not shown) is so arranged that when the throttle valve 8 is nearly wide open, the further opening of this valve throws the valve 10 wide open. At all other times, the valve 10 is held close by a spring (not shown).

It will be seen that under all the usual running conditions of the engine, the primary carburetor, or first stage only, is in service, and the second stage comes into service only when the throttle is thrown wide open to full power. Twelve is a cylindrical chamber with an extension 13 of reduced diameter connected by the passage 14 with the chamber 15, above the throttle valve. The chamber 12 is connected with the float chamber 16, by means of the restricted passage 17, so that the gasoline at all times in this chamber 12 stands on a level with the level in the float chamber. Eighteen is a loosely fitting plunger with an extension 19 on its upper end, forming a piston in the chamber 13. An atmospheric opening 20 is located in the wall of chamber 12 and a passage 21 leads from chamber 12 to the mixing chamber 6, through which passage air is constantly drawn in the mixing chamber.

It will be seen that in the operation of the engine, when the throttle is closed, the vacuum of the manifold acting on the piston 19 causes the plunger 18 to rise

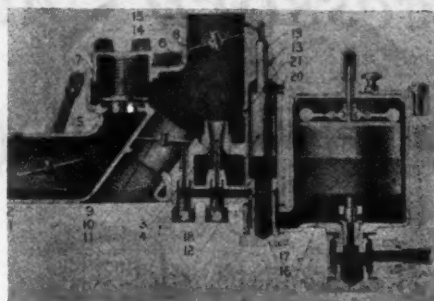


Fig. 13—A cross-section of the Ball and Ball carburetor used on the 1918 Oldsmobile

to its upper position, thus closing the passage to the chamber 15. The space below the plunger 18 is now filled with gasoline from the float chamber and the mechanism is ready for action.

The opening of the throttle 8 breaks the vacuum in chamber 15, and releases the plunger 18, which falls and displaces the gasoline underneath the plunger, causing it to flow into the space above the plunger, where it is quickly discharged through the passage 21 to the mixing chamber, thus augmenting the normal supply of gasoline and causing a rich mixture to momentarily enter the cylinder. This develops a strong pickup.

NASH TRUCK AXLE

Q—Publish a diagram and give a short description of the rear axle assembly in the Nash truck.—Reader.

Two models built by Nash company are equipped with the Clark internal drive axle. It is composed of two major assemblies, the driving unit and the load carrying unit on which the wheels are free to rotate. The driving unit is located in front of the load carrying member but is not supported by it at the center. Instead the driving unit is supported at each end from the integral spring seats and brake spider. Connection from driving unit to load member is accomplished through two small spur pinions at the ends of the driving member which mesh with the large internal

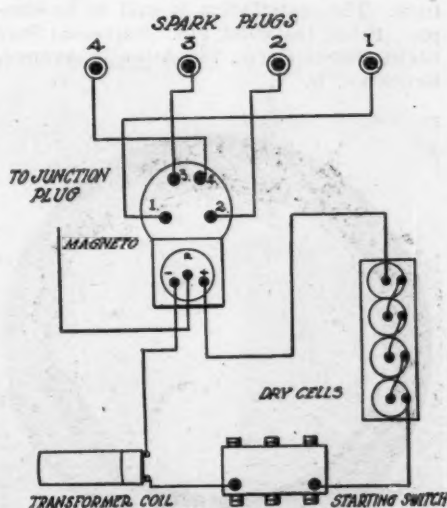


Fig. 14—Wiring diagram of Maxwell 25 using Simms magneto

gears fastened to the wheels. Fig. 12 shows a phantom view of the axle assembly.

PREVENTING EXCESSIVE DISCHARGE

Q—Is there any device that can be installed on the Delco system of the 1917 Oakland model 37 to prevent the heavy discharge if the ignition switch is left on?—D. Prescott, Elkhart, Ind.

There is no device that can be installed to overcome this difficulty. It must be remembered that any attempt to make an installation of this kind is a step toward defeating the correct operation of the system. The amount of discharge current passing through the windings of the generator on this car when the ignition switch is on may reach 15 or 18 amp. The time of discharge, however, is only a short interval between the instant that the ignition button is turned on and the foot is placed on the starting pedal to crank the engine. Of course, if you forget to turn off the ignition switch it would possibly run down the battery if left on long enough. The only thing to do is not to forget to turn the ignition switch off.

OIL PUMPING

The Readers Clearing House Dept. has received many inquiries relating to oil pumping and how it can be remedied. With regard the Essex cars the manufacturers consider it quite important to warn Essex owners against having pistons and rings changed to remedy the so called oil pumping. They state that 90 per cent of over oiling condition is caused by rich mixtures, the result of a minor engine adjustment being at fault, or improper operation of the car, that is, not taking advantage of the facilities incorporated in the manufacture of the Essex car.

The principle preventatives of over oiling conditions are hot engine, lean mixture and good oil. The hot engine is up to the driver, also lean mixture to some extent, but improper mixture can be attributed to engine adjustment. The radiator shutter should be kept closed until the red fluid in the motometer rises to the center of the circular opening; if anti-freeze is used, to the lower rim of the circular opening. If necessary to lower this reading, move the adjustment one notch at a time only. The gasoline adjustment on the dash should be pulled out only to facilitate starting and with the engine properly heated, the leanest mixture should be used.

The choke arrangement should be used only sparingly as with this arrangement pulled out the carburetor air valve is closed and due to the downward feed, injects raw fuel into the combustion chambers. The minor engine adjustments comprise principally the carburetor packing gland. Any packing gland needs attention in time and thus adjustment is a very simple job. Other points such as incorrect valve tappet settings ignition contact points and spark plug gap adjustments are only small jobs.

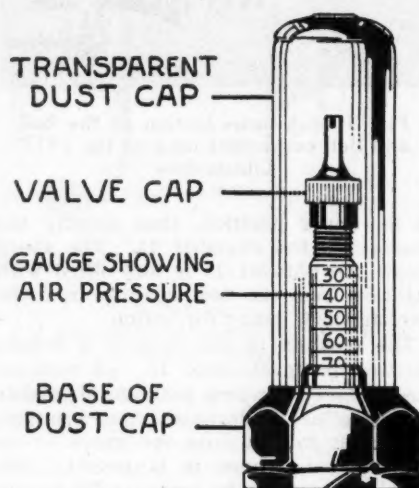
The oil recommendations cover medium light body oil in summer and light body oil in winter.

The Accessory Show Case

New Fitments for the Car

Tireometer

One of the recent developments in the tire business is the Tireometer tube, a product which is made in Atlanta, Ga., and which is now being distributed through a dealer organization, by Currie Bros. Co., Inc. The tube itself in appearance is very little different from other tubes, but the rubber is made in a laminated form and a special preservation is incorporated in the rubber which it is claimed insures endurance and gives protection against heat. The striking feature of the tube is the non-leaking valve which is nothing more or less than a pressure gauge which indicates at all times the exact air pressure in the tire. A transparent, practically unbreakable dust cap protects the tireometer without in any way interfering with the instant reading of the gage. It is very evident that with the tireometer the motorist may tell at a glance the air pressure within the tire, and since statistics seem to prove that 90 per cent of all tire troubles are caused by underinflation this tube should prove to be an extremely valuable contribution to the tire industry.



Sectional view of tireometer

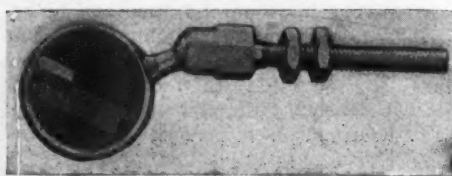


Showing tireometer attached to tire

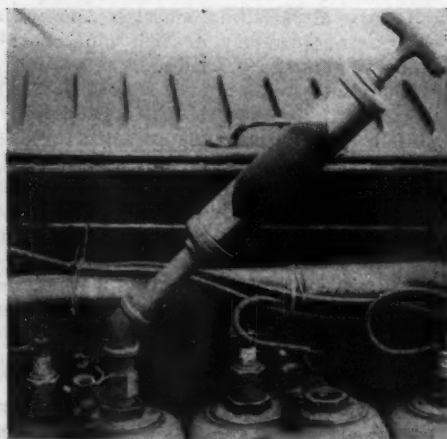
engine is turned over slowly until the handle of the finder is forced out full length. In a like manner the trouble finder can be applied to each cylinder. It is equipped with connections for all cars. Price \$7.50. S. C. M. Corp., 105 E. 19th Street, New York.

Chapman Trouble Finder

The Chapman trouble finder is a process for locating gasoline engine troubles. To apply this trouble finder all spark plugs must be removed and the device attached by means of its screw connection at the spark plug opening of the front cylinder. Using the crank, the



Cole cowl relite



Chapman trouble finder

Star Light Signal

This signal replaces the tail light, and a standard red light shows at driving speeds. As soon as the brake is touched the word SLOW is flashed in large, white letters. This is accomplished by the rotation of the signal through a quarter turn. The installation is said to be simple. Price, installed, \$10. Universal Star Light Signal Corp., 718 Atlantic Avenue, Brooklyn, N. Y.



Cox tire changing tool

Cole Cowl Relite

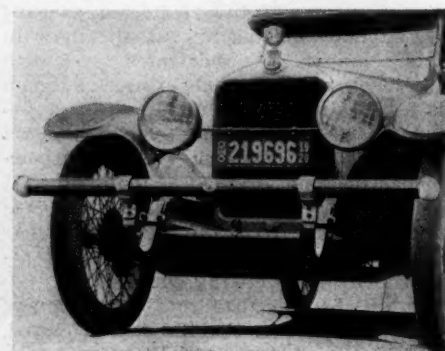
The Cole cowl relite is a small mirror 1 in. wide with a ball and socket joint which permits it to be instantly adjusted to any angle. It is bolted to the cowl board alongside of the instrument it is to light and it catches, intensifies and reflects the light from the cowl lamp directly onto the figures of the instrument. It spots a sharp light on instruments which usually are out of the dim rays of the cowl lamp enabling the figures to be instantly read on the darkest night. Instruments already illuminated by the cowl lamp are made doubly distinct by the relite. Relites are manufactured by the Cole Visible Gas Gauge Co., 1364 S. Figueroa Street, Los Angeles, and retail for \$1.

Balcrank Bumper

A sturdy, hollow steel bar which extends just beyond the tire line on each side and heavy, vertical springs which hold it in such a position that it is claimed to prevent over-riding or under-riding of bumpers on other cars are the main features of the Balcrank bumper. The bar comes either black or nicked, ornamented by aluminum balls at either end of the bar. The springs are also of black enamel. The weight of this bumper is 38 lb. and is attached by universal fittings. Cincinnati Ball Crank Co., Cincinnati.

Cox Tire Changing Tool

To make tire changing a simple task and to eliminate the use of a hammer and the springing of the rim, which is caused by using a hammer, is the purpose of the Cox quick detachable rim tool. Holes must be drilled in the rims to correspond with the thumb screws of the rim tool. After the tool has been placed in the rim the thumb screws are turned until the points are inserted into the holes in the rim. Then the handle is pulled back making it possible to easily remove the tire.—Cox Mfg. Co., Anderson, Ind.



Balcrank bumper

Service Equipment

Time Savers for the Shop

Visible Measure Oil Pump

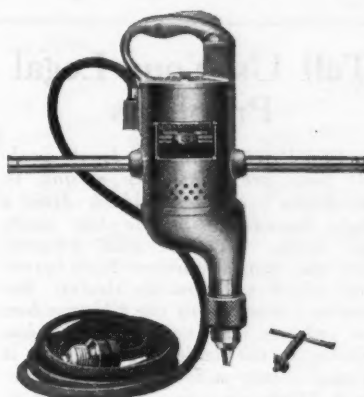
A pump which can be screwed into any standard sized steel barrel is a new development of the Parbee Mfg. Co., Inc., Hannibal, Mo. This pump is equipped with a one-quart visible measure fitted with a nonleaking automatic valve which allows rapid filling up to one exact quart when it automatically shuts off, opening again to allow the draining of the measure. After attaching the pump the cocks above and below the measure are closed and by means of a hand tire pump, which is part of the equipment, air is pumped into the barrel until the gauge registers from 3 to 10 lbs. Oil will then be delivered into the visible measure upon opening the top cock.

Greb Rear Axle Press

This press is designed for removing axle and drive shaft gears and pressing on axle gears, having a capacity for shafts up to 1¼ in. and gears to 6½ in. It can be used for removing connecting rod wrist pins, timing gears, and spindle body bushings, and also for straightening connecting rods. By pushing the base plate to one side a solid base is procured for the axle to rest on, and by pushing the plate in the opposite direction the hole centers with the hollow shaft allowing the axle to pass through the base. The press may be secured in an upright position or can be used horizontally by means of a hinge. The five operations are shown in the illustration. —Greb Co., Inc., 172 State Street, Boston.

Crankshaft Lapping Tool

The top bar of this tool is V shaped holding case hardened rollers. Adjustment is made by tightening the nuts on the studs which protrude through the

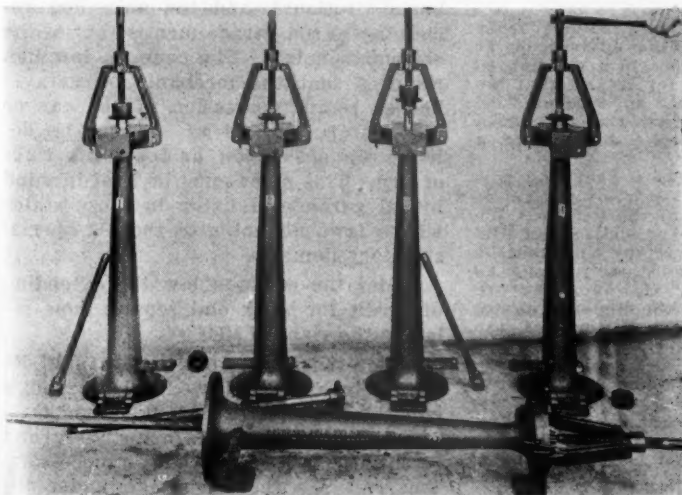


Automatic stop drill

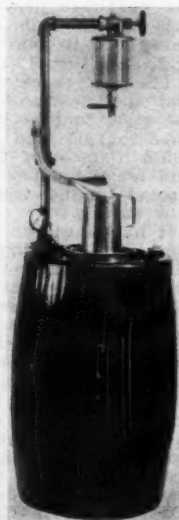


Economical grease gun

roller bar. The lower ends of the studs are anchored in the solid bar at the bottom on which a carbon stone rests. The stone is held in place by clips and can be replaced when worn out. Elliott Tool Co., Champaign, Ill.



Greb rear axle press showing five operations



Visible measure oil pump

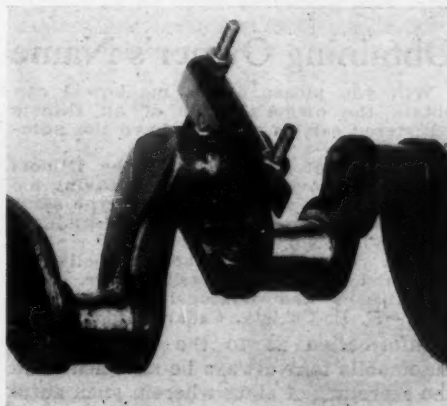
Grease Gun

A new and improved grease gun that can be attached to any original container (from 5 lb. package to 42 gal. barrel) has recently been perfected by J. Montgomery of the Stockton & Sutter Street garage, San Francisco. One desirable feature of this method of applying grease is the great economy, not an ounce of grease being left in the barrel it is claimed.

The illustration shows how the device is operated. First the end of the barrel or package is knocked out and the receptacle shown at C placed over the open end. The receptacle is then firmly attached to the barrel. The U frame on wheels is run in position and the barrel attached to the frame. By means of the gears E and the handle D the barrel is elevated sufficiently to enable the operator to run the open end of the barrel downward as shown in the illustration. This permits the contents of the barrel to enter the receptacle C and by means of the handle B and the grease pump the grease is delivered through the hose. All these operations are very simple and can be performed quickly and easily.

Automatic Stop Drill

This portable drill is motor driven using either alternating or direct current and automatically stops when not in use due to the fact that the current contact functions through a spring lever in the handle which is released as soon as the pressure of the operator's grip is removed. It is made in six sizes from 3/16 in. to ¾ in. A portable grinder equipped with the same style of control is also manufactured by the Wodack Electric Tool Corp. This is made in three sizes depending on the wheel capacity. Both tools are fitted with Wodack universal motors. Wodack Electric Tool Corp., 23-27 S. Jefferson St., Chicago.



Elliott crankshaft lapping tool

Law in Your Business



By Wellington Gustin



Dealer's License for Second-Hand Car Business

I have been doing repair work on automobiles and am considering buying and selling second-hand cars. What would be the proper way and proper kind of license to apply for from the secretary of state so that I can transfer it from one car to another and still be within the law? As you know it may become necessary to transfer it two or three times in a single day.—C. Durain, Whipple Repair Shop, Chicago.

We think you would come under the designation of dealer and as such should apply for and receive dealer's registration. Application blank will be furnished by the Secretary of State at Springfield. The rate of fee is \$12 a year. Duplicates of number plates are furnished upon payment for each set of two plates the sum of \$12 a year. Such number plates shall be conspicuously displayed upon the front and back of every motor vehicle of the dealer when the same is operated or driven on the streets or highways.

Upon receipt of your verified application the secretary of state will assign you a general distinctive number for all the motor vehicles owned or controlled by you. You must give the secretary the trade name or names of the make of the motor vehicle or vehicles dealt in by you, also the character of the motor power, the amount of such motor power stated in figures of horsepower.

With such registration you may transfer your number plates from one car to another at will. Upon the sale of a car the dealer must give the purchaser a bill of sale setting forth the name and address of the purchaser, date of purchase, together with a description of such motor vehicle showing name of manufacturer, style, factory and engine numbers, and amount of horsepower.

Obtaining Owner's Name

Will you please advise me how I can obtain the owner's name of an Illinois registered car, of which I have the number?

An accident occurred and the Illinois car owner drove away without leaving his name. Would also like to have the same information in regard to a car registered from Wisconsin.

Iowa registered cars are compelled to have owner's name in a card inside. Does the Illinois and Wisconsin law require this?—H. B. Christy, Cedar Rapids, Iowa.

Information as to the owner of an automobile may always be obtained from the secretary of state wherein such automobile was registered. Write the Secre-

Tell Us Your Legal Problems

SEEMINGLY knotty legal problems are constantly arising in the dealer's business, which even a slight knowledge of the law easily may solve. MOTOR AGE presents here the most common legal problems which confront the dealer. Mr. Gustin, a member of the Chicago bar, not only is well versed in the law relating to the dealer, but presents it in such a way as to be readily understood by the layman. In addition to his articles, Mr. Gustin will gladly answer such individual inquiries on knotty points as may be submitted to him.

tary of State for Illinois at Springfield, Ill., for the name of the owner of the Illinois car, and to the same official for Wisconsin at Madison, Wis., for name of the owner of the Wisconsin car.

The certificate of registration is required always to be in the possession of the operator of the car, or firmly attached in some accessible place in the automobile, under the Wisconsin law, but the Illinois law has no such requirement. However, copies of the registration lists for Illinois are sent out to the sheriffs and the clerks of all counties, and to the chiefs of police of cities and towns of 5,000 population and over.

Breach of Contract

In 1919 we sold for a customer his used car, giving him the full sales price less a deposit of \$250, which was to apply on the purchase price of a new car, and in the order which he signed for this car he agreed to take delivery of the car on or before Dec. 1, 1919.

The car came according to his order and specifications, and he advised us at the time that he was not in a position to take the car and pay for it and that we could dispose of the car to someone else and let the deposit stand, and that some time later he would take delivery of a new car.

It has now run on for a year and this depositor is suing us for the return of his \$250 or the return of the deposit. We are willing to let the deposit stand and give him the benefit of it any time that he wants to purchase a new car as long as we have the agency. However, we are not willing to return the deposit, as we will not make any money out of the transaction until such time as he takes delivery of a new car. We paid our salesman a commission of 5 per cent on the used car which we sold for him, so we are really out the 5 per cent on \$3,475, and are holding this deposit against this commission.—Davis Cadillac Co., Joplin, Mo.

Your attorney will give you proper advice as to your rights in this litigation.

From the facts you give you should set up a counterclaim for damages for breach of contract. Ordinarily these damages would be the sum or amount you have lost by reason of the customer's failure and refusal to take the car as ordered by him, and pay the price agreed upon. In arriving at your damages the 5 per cent paid your salesman may be taken into consideration.

You are quite right in withholding the deposit money in that you obtain the advantage of being defendant in the action. If your counterclaim is greater than the deposit you should be able to obtain judgment for this difference.

Illinois Declares Garage Keepers' Lien Act Is Unconstitutional

A service station makes repairs at various times upon A's car, A having an open account with the proprietor of the service station. Subsequent to the making of the repairs, A executes a blanket chattel mortgage upon his personal property to his father. This mortgage does not especially describe the automobile upon which the repairs were made.

(1) Does the service station have a lien under the laws of Illinois upon A's automobile for the repair bill?

(2) If he has a lien is it superior to the rights of the mortgagee under the statement set out above?—John Fox, Illinois.

You do not have a lien on the automobile under the Illinois law. The Supreme Court of this state has declared the Garage-Keepers' Lien Act of 1917 to be unconstitutional, and the only lien remaining to the garage men is that of the old common law. The common law lien requires that the mechanic or garage-keeper retain possession of the car or other property, and as soon as he delivers up possession he loses his right of lien. This point must be kept in mind by all garagemen living in those states whose laws do not give them a special statutory lien.

Under the common law the extending of credit for work and repairs done releases the right of lien.

Under the statute of Illinois (now declared invalid) you would have had a superior right to the blanket mortgage, for that lien attached immediately and retention of the car was unnecessary. You can see the advantage under the statute. Let's get a law that will stick.

The Automotive Repair Shop

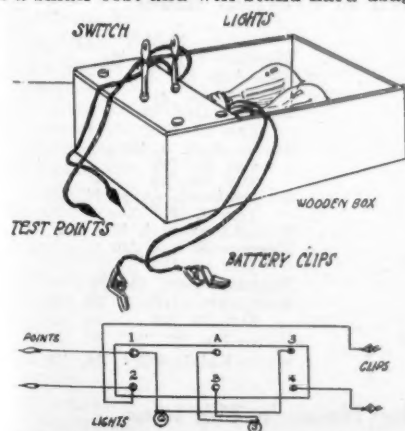
Practical Maintenance Hints

Inexpensive Electric Test Box

In this test box a double throw, double pole switch, two light bulbs, a pair of test points, a pair of battery clips and the necessary wire is used. The wires leading to the battery clips may be made long enough to allow using the battery in the car or the shop. The wiring diagram is shown on the right. The test points are connected to terminals 1 and 2, the battery clips to 2 and 4, one light to 1 and 3 and the other light to A and B. This allows the using of one light alone or both lights in series. When working on a dead wire the clips are attached to a battery. Then if both lights are used throw switch A into contact with terminal 3 and switch B into contact with terminal 4. If a connection is made between the test points both lights will be turned on. If but one light is desired throw switch A over in contact with terminal 1.

No Battery Needed for Live Circuit

When working on a live wire circuit no battery is needed. To use one light in this manner place switch A in contact with terminal 1 and switch B in contact with terminal 2 or by throwing switch A in contact with terminal 3 the lights will be placed in series. This is a good combination for testing out the Ford lighting system. With the engine running slowly the lights are turned on and when the engine starts to miss it indicates either a weak magneto or a short in the wiring. Now by turning off the car lights and placing one test point on the magneto post of the coil box and the other test point on the engine the lights in the test box will light. If the engine starts to miss a weak magneto would be indicated but if it runs all right a short in the wiring would be indicated. This test box can be easily constructed at a small cost and will stand hard usage.

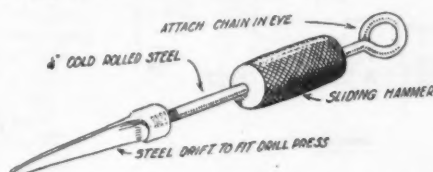


Electric test box which can be constructed easily and at small cost



Wrist Pins for Punchers

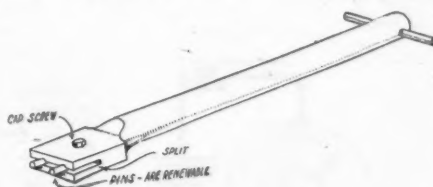
For punching holes in gaskets, old wrist pins can be used advantageously. Every garage has old discarded wrist pins that can be ground down for this purpose as shown in the sketch.



Handy Drill Press Drift

During a slack period several of the type of drill press drifts such as shown in the sketches can be made up. The drift is forged on the end of round steel stock, then cut off and the end tapped out to take the round rod on which the sliding hammer is placed.

These drifts can be attached to the drill presses, milling machine, etc., by a chain through the eye.



Improved Spanner Wrench

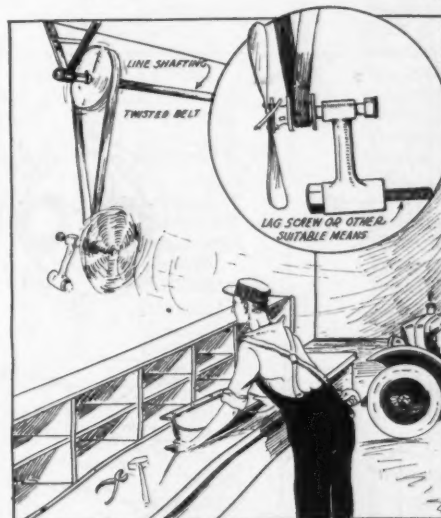
With the average spanner wrench the pins become bent, worn, or twisted off. The trouble can be overcome by making a wrench as shown in the sketch. The pins of this sort of wrench can be quickly renewed by loosening the securing nut.

Dislodging Key Without Removing Transmission

A short wire or key will sometimes short the magneto between the transmission cover and the field coils on a Ford and removing the magneto post does not help. To remedy this, hitch a car behind, put the crippled Ford in high gear and tow it backwards as fast as it can be steered. This reverses the splash of oil and will dislodge the key which may be taken out below, thus avoiding the work of removing the transmission cover.

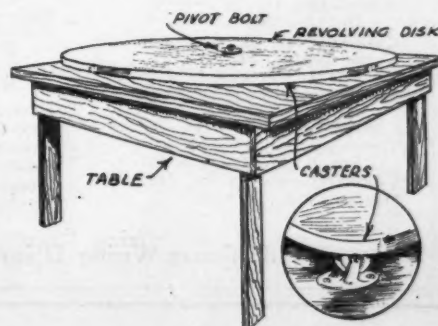
Automobile Fans Used for Shop comfort

For garage or repair shop purposes one or more fans from automobiles bracketed at suitable locations on the walls or floor columns and belted to the line shafting afford desirable ventilation during the hot seasons of the year at practically no expense when several of these parts are available. The pulleys of these fans are usually flanged which permits of setting the fan at right angles to the shaft using a twisted belt for driving. These fans though small are efficient and a surprising amount of air can be put in motion with them when speeded up. The direction of drive is opposite to that on a car which drive is obtainable by the direction the driving belt is twisted.



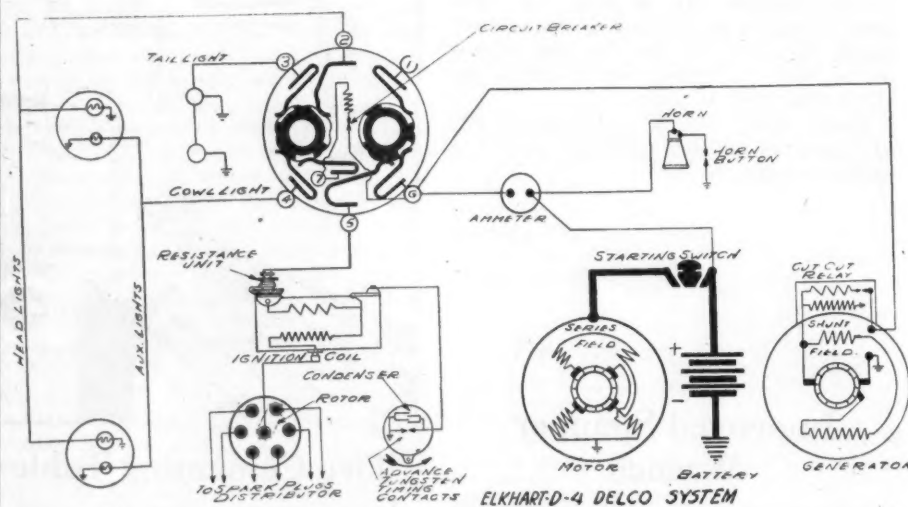
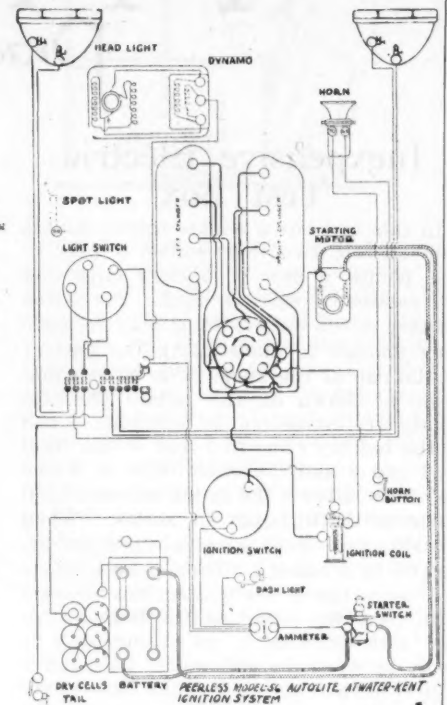
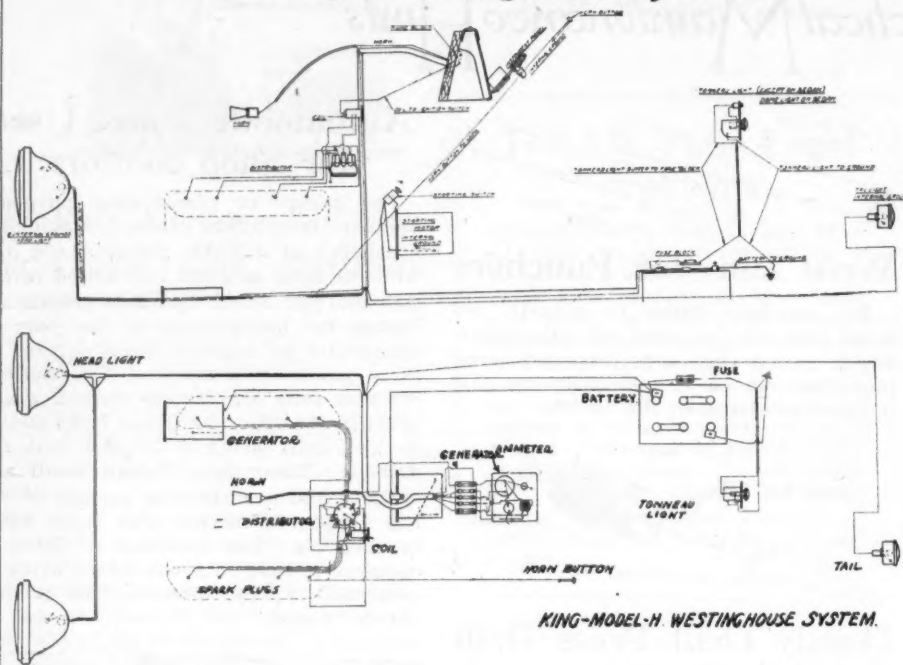
Tire Cementing Table

A revolving table is a time saver in cementing tires and retreads applied to them by the cold cure process. Such a table may be made by taking four large castors and mounting them upside down on the table as shown. Then the disk is bolted in place by the center bolt shown in the plan view.



Motor Age Weekly Wiring Chart No. 118

1920 King—Westinghouse System



Above: 1920 Peerless
—Auto Lite and Atwater-Kent System

Left: 1920 Elkhart—
Delco System

Name of Car and Date on Which Wiring Diagrams Have Appeared in Previous Issues

Allen—June 17, '20
Sept. 30, '20
American Beauty—Feb. '17,
'21
Auburn—Sept. 9, '20
Apperson—Aug. 5, '20
Buick—July 15, '20
Dec. 23, '20
Cadillac—Nov. 18, '20
Case—Aug. 5, '20
Oct. 7, '20; Feb. 17, '21
Chalmers—June 17, '20
Feb. 24, '21
Cleveland—Feb. 24, '21
Cole—Dec. 9, '20
Jan. 6, '21; Jan. 20, '21
Crow-Elkhart—July 29, '20
Daniels—Feb. 17, '21

Davis—Aug. 12, '20
Dorris—Dec. 9, '20;
Feb. 24, '21
Dort—Aug. 12, '20
Dodge—Sept. 23, '20
Elcar—Oct. 28, '20
Dec. 2, '20
Elgin—Oct. 14, '20
Franklin—June 3, '20
Dec. 2, '20
Grant—Aug. 12, '20
Nov. 25, '20
Harroun—July 15, '20
Haynes—June 24, '20
Hudson—Jan. 13, '21
Hupmobile—Feb. 3, '21
Jordan—June 10, '20
July 29, '20

Kissel—Aug. 19, '20
Oct. 21, '20
Lexington—July 29, '20
Dec. 16, '20
Locomobile—June 3, '20
Mitchell—Jan. 6, '21
Moline-Knight—July 22, '20
Nov. 4, '20
Moon—July 29, '20
Aug. 19, '20
Moore—Nov. 11, '20
National—Dec. 16, '20
Oldsmobile—Sept. 16, '20
Nov. 25, '20
Dec. 23, '20
Packard—Oct. 7, '20
Peerless—Nov. 18, '20
Pierce-Arrow—July 15, '20
Feb. 10, '21

Premier—Feb. 10, '21
Reo—July 22, '20
Feb. 10, '21
Roamer—Dec. 30, '20
Feb. 10, '21
Saxon—Sept. 9, '20
Oct. 21, '20
Dec. 30, '20
Scripps-Booth—Aug. 26, '20
Feb. 3, '21
Sheridan—Feb. 3, '21
Stearns—Nov. 4, '20
Jan. 13, '21
Stephens—Sept. 16, '20
Studebaker—July 1, '20
Oct. 29, '20
Velie—Jan. 20, '21
Willys-Knight—Oct. 14, '20

Additional Wiring Diagrams May Be Found in the Readers' Clearing House in This Issue

Carbureters on 1920 Cars

Motor Age Maintenance Data Sheet No. 139

One of a series of weekly pages of information valuable to service men and dealers—save this page

Concluded from last week.

Car and Model	Make of Carbureter	Model of Carbureter	Size of Carbureter	Type of Carbureter	Flange
Lincoln	Stromberg	O. 3	1½	Vertical	Fore & Aft
Locomobile	Own	.....	1¾	Vertical	Horizontal
Lorraine, 21T	Johnson	A	1	Vertical	Horizontal
Maibohm, B.	Tillotson	.....	1	Vertical	Transverse
Marmion, 34	Stromberg	H. 3	1½	Horizontal	Vertical
Maxwell, 25	Eagle	.....	1	Vertical	Transverse
McFarlan, 147	Stromberg	H. 3	1½	Horizontal	Vertical
Mercer, Series 5	Ball & Ball	S. V. 22	1½	Vertical	Horizontal
Meteor, R & RR	Stromberg	L. B. 2	1¼	Horizontal	Vertical
Metz, M. Six	Stromberg	M. B.	1	Horizontal	Horizontal
Mitchell, F40	Stromberg	O. 2	1¼	Vertical	Fore & Aft
Monitor	Stromberg	L. S. 2	1¼	Vertical	Transverse
Moon, 6-48	Rayfield	P. L. 3	1¼	Vertical	Fore & Aft
Moon, 6-68	Rayfield	M	1¼	Horizontal	Vertical
Monroe, S9-10	Zenith	H. P. 5A	1¾	Horizontal	Horizontal
Murray	Zenith	O-5D	1¼	Vertical	Special
Nash, 681-2	Marvel	E	1¼	Vertical	Fore & Aft
National, Sextette	Rayfield	G. 4P	1½	Vertical	Fore & Aft
Nelson, E.	Zenith	H. T. 4E	1	Horizontal	Special
Noma, 10	Claudel	C5	1¼	Vertical	Fore & Aft
Norwalk, 430-KS	Carter	Lo	1	Horizontal	Horizontal
Oakland, 34C	Marvel	E	1	Vertical	Fore & Aft
Oldsmobile, 46	Ball & Ball	2S	1¼	Vertical	Transverse
Olympian, 45	Stromberg	LB	1	Vertical	Transverse
Overland, 4	Tillotson	.....	¾	Horizontal	Horizontal
Packard, Single Six	Own	S. S.	1¾	Horizontal	Vertical
Paige, 642	Stromberg	M. B. 1	1	Horizontal	Vertical
Paige, 6-66	Rayfield	G	1½	Vertical	Fore & Aft
Paterson, 650	Stromberg	L. B. 1	1	Horizontal	Vertical
Peerless, 56 S6	Ball & Ball	D. V. 12	1½	Vertical	Transverse
Piedmont, 4-30	Carter	Lo	1	Horizontal	Horizontal
Piedmont, 6-40	Stromberg	L. B.	1	Horizontal	Vertical
Pierce Arrow, 38	Own	.....	1¾	Vertical	Transverse
Pierce Arrow, 48	Own	.....	2	Vertical	Transverse
Pan, A.	Zenith	1P4	1	Horizontal	Horizontal
Pilot, 6-45	Tillotson	C	1	Horizontal	Vertical
Porter, 46	Zenith	Special	2	Vertical	Fore & Aft
Premier, 6D	Johnson	A	1¼	Vertical	Transverse
Ranger "Four," B.	Zenith	H. P.	1	Horizontal	Horizontal
Reo, T6 & U6	Rayfield	L. L. 3P	...	Vertical	Transverse
Revere, Series F	Stromberg	4M	1¾	Vertical	.....
Roamer, D-4-75	Stromberg	3-0	1½	Vertical	Fore & Aft
Roamer, C-6-54	Stromberg	L. B. 2	1¼	Horizontal	Vertical
R. & V. Knight	Stromberg	A3843 & L. B. 2	1¼	Horizontal	Horizontal
Saxon, 125	Stromberg	M2	1¼	Vertical	Transverse
Sayers Six, D. P.	Zenith	H. P. 4A	1	Horizontal	Vertical
Scripps Booth, B39	Marvel	E	1	Vertical	Fore & Aft
Seneca, L20	Schebler	R	...	Vertical	Transverse
Severin	Stromberg	L. B. 2	1¼	Horizontal	Vertical
Singer	Stromberg	D. 3	1½	Vertical	Fore & Aft
Skelton, 35	Carter	Lo	1	Horizontal	Horizontal
Sheridan, B40-3	Zenith	T. A.	1	Vertical	Fore & Aft
Spacke, 21	Carter	Lo	1	Horizontal	Horizontal
Standard, 1	Zenith	05-D	1¼	Vertical	Transverse
Stearns Knight	Schebler	R	1¼	Vertical	Fore & Aft
Stevens Duryea, E.	Stromberg	03	1½	Vertical	Fore & Aft
Stephens, 80	Tillotson	H1-A	1¼	Horizontal	Vertical
Studebaker, EJ	Stromberg	OS-1	1	Vertical	Fore & Aft
Studebaker, EH	Stromberg	LS-2	1¼	Vertical	Fore & Aft
Studebaker, EG	Ball & Ball	.....	1½	Vertical	Fore & Aft
Stutz	Stromberg	H. 3	1½	Horizontal	Vertical
Templar, 445	Stromberg	M. 2	1¼	Vertical	Transverse
Texas, A. B.-38	Carter	Lo	1	Horizontal	Horizontal
Tulsa, E 1-2-3	Zenith	H. P. 5	1¼	Horizontal	Vertical
Velie, 34	Stromberg	O. S. 1	1	Horizontal	Vertical
Velie, 48	Stromberg	O. 2	1¼	Vertical	Fore
Westcott, C38	Rayfield	L. 3P	1¾	Vertical	Fore & Aft
Westcott, C48	Rayfield	M. 3	1¾	Horizontal	Vertical
Winther, 61	Stromberg	O. 3	1½	Vertical	Fore & Aft
Winton, 25	Stromberg	O. 3	1½	Vertical	Fore & Aft
Winton, 24	Stromberg	O. 3	1½	Vertical	Fore & Aft
Wasp, 2011	Stromberg	.....	1¾	Vertical	Transverse

COMING MOTOR EVENTS

Automobile Shows

Buffalo, N. Y.	Annual Automobile Show	Feb. 26-March 5	Newark, N. J.	Automobile Show	March 12-19
Wilmington, Del.	Automobile Show	Feb. 28-March 5	Boston, Mass.	Annual Show	March 12-19
Binghamton, N. Y.	Annual Show	Feb. 28-March 5	Omaha, Neb.	Annual Automobile Show	March 14-19
St. Joseph, Mo.	Automobile Show	Feb. 28-March 5	Washington	Annual Automobile Show	March 14-19
Muskegon, Mich.	Automobile Show	Feb. 28-March 5	Uniontown, Pa.	Automobile Show	March 16-19
Duluth, Minn.	Annual Automobile Show	Feb. 28-March 5	Greenville, S. C.	Automobile Show	March 16-19
Portland, Me.	Annual Automobile Show	Feb. 28-March 5	Detroit	Annual Automobile Show	March 19-26
Huntington, Va.	Automobile Show	Feb. 28-March 6	Peoria, Ill.	Automobile Show	March 19-26
Quincy, Ill.	Automobile Show	March 1-5	Torrington, Conn.	Annual Automobile Show	March 20-26
Wichita, Kan.	Annual Automobile Show	March 1-5	Ottumwa, Iowa	Annual Automobile Show	March 23-26
Des Moines	Open Car Show	March 2-5	Greenfield, Mass.	Automotive Show	March 28-April 2
Fairmont, W. Va.	Automobile Show	March 2-5	Columbia, S. C.	Automobile Show	March 28-April 2
Chester, Pa.	Automobile Show	March 2-5	Chattanooga, Tenn.	Annual Automobile Show	April
Norwich, Conn.	Automobile Show	March 3-5	Charlotte, N. C.	Automobile Show	April 4-9
Brooklyn	Automobile Show	March 5-12	Bridgeton, N. J.	Annual Automobile Show	April 2-9
Atlanta	Automobile Show	March 5-12	Groversville, N. Y.	Annual Automobile Show	April 3-9
New Haven, Conn.	Annual Automobile Show	March 5-12	Denver	Automobile Show	April 3-9
Atlantic City	Annual Automobile Show	March 5-12	Seattle	Annual Automobile Show	April 4-9
Pittsburgh, Pa.	Annual Automobile Show	March 5-12	Mexico City	Automobile Show	April 10-25
Des Moines	Enclosed Car Show	March 7-10	Buffalo	First Ann'l Motors and Sportsmen's Show	April 11-16
Jacksonville, Ill.	Automotive Show	March 7-12	Charlotte, N. C.	Carolinas Automobile Show	April 11-16
Indianapolis	Automobile Show	March 7-12	Lincoln, Ill.	Automobile Show	April 21-23
Springfield, Mass.	Annual Automobile Show	March 7-12			
Scranton, Pa.	Passenger Car Show	March 7-12			
Syracuse, N. Y.	Automobile Show	March 7-12			
Nashville, Tenn.	Annual Automobile Show	March 7-12			
Spokane, Wash.	Automotive Show	March 8-12			
Wheeling, W. Va.	Annual Automobile Show	March 10-11			
Pendleton, Ore.	Annual Automobile Show	March 10-12			
Fort Wayne, Ind.	Automobile Show	March 10-16			
Antigo, Wis.	Annual Automobile Show	March 11-13			
Richmond, Va.	Automobile Show	March 12-19			

Tractor Shows

Scranton, Pa.	Truck & Tractor Show	March 14-17
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Races

Indianapolis Sp'wy	500 Mile Race	May 30
Uniontown Sp'wy		June 18
Strasburg	French Grand Prix	July 28
Uniontown Sp'wy	Annual Autumn Classic	Sept. 5

Business Notes

The Twin Ports Steel & Tractor Co., which was incorporated recently with \$250,000 capital, has taken over the entire business and works of the Evered Foundry & Machine Works at Superior, Wis. It will continue the manufacture of gas tractors, hoisting engines and power winches, but will also take on jobbing orders for pattern, casting and machine work.

As the result of orders taken at the various shows held so far this year, the motor truck division of the Stoughton Wagon Co. at Stoughton, Wis., is increasing its force and probably will be employing a normal force by March 1.

The Acme Body Works of Appleton, Wis., established about 18 months ago to manufacture passenger car and motor truck bodies, cabs, etc., has been incorporated under the same style, with a capital stock of \$60,000.

The Para Auto Tire Co., Chicago, an Illinois corporation, has filed an application for a charter to do business in Wisconsin. The application states that \$50,000 is to be used in Wisconsin, but no further information is given.

The Duplex Storage Battery Co., of Beaver Dam, Wis., a \$1,000,000 corporation manufacturing storage batteries, has elected the fol-

lowing officers at its annual meeting: President, John W. Deniger; vice-president, John V. Zweck; secretary and general manager, Peter M. Kettenhofen; treasurer, M. A. Jacobs.

Salyers-Walters Motor Co., Sioux City, Iowa, have been appointed distributors for the complete line of Mitchell motor cars for northeastern Nebraska, northwestern Iowa, and a portion of the southeastern part of South Dakota. E. B. Salyers is president of this new organization.

The Whittemore-Sim Co., of New York City has obtained the exclusive distribution of the Wilson combination machine, the product of K. R. Wilson, Buffalo.

The Landis Tool Co., Waynesboro, Pa., manufacturers of cylindrical grinding machines, will make a general reduction in prices on all machines, effective March 1, with the exception of the crankshaft grinding machine. This reduction will average 15 to 20 per cent on the company's entire product with the one exception noted.

The Automotive Finance Corp. of Milwaukee is the name of a new corporation organized under the laws of Wisconsin to handle motor car, truck and tractor securities, notes, etc. The initial capitalization consists of \$100,000 preferred stock and 500 shares of common stock without par value.

The Auto Life Tire Chain Co. of Milwaukee, at its annual meeting, elected the following offi-

cers: President, E. A. Hoya; vice-president, A. L. Wolff; secretary, William F. Schad; treasurer, F. W. Andree. It was decided to increase the capitalization from \$25,000 to \$125,000 preferred stock and 2300 common shares without par value. A factory has been erected and equipped in Cedarburg, Wis., not far from Milwaukee, for the manufacture of non-skid devices for passenger and commercial cars and other automotive equipment of similar character.

The Prairie du Chien (Wis.) Tool Co., which several months ago equipped a plant to manufacture tool grinders and other portable garage and machine shop specialties, is disposing of a new issue of \$40,000 preferred stock to provide more adequate working capital. The plant is working at full capacity.

The Green Bay Nash Co. has been organized at Green Bay, Wis., and incorporated with \$30,000 capital, to take over the business of a partnership of similar style which for some time has been acting as Nash dealer in Brown county.

The Lochen Motor Co. of Milwaukee is the new style of the former Lochen-Moore Co., local dealer in the Hupmobile, Apperson and Moon. Walter Lochen has acquired the interests of Kenneth D. Moore and George Bour, Jr.

Everhardt & Co. of Whitewater, Wis., is a new corporation organized with \$30,000 capitalization by R. J. Everhardt, R. C. Cox and R. J. Cummings to act as distributor and dealer in motor cars, trucks, automotive equipment, etc.

The New Holstein Auto & Tractor Sales Co. of New Holstein, Wis., has been incorporated for \$25,000 by John Langenfeld, Ben M. Stiefvater and Adolph L. Langenfeld, to deal in motor cars, trucks, tractors, etc.

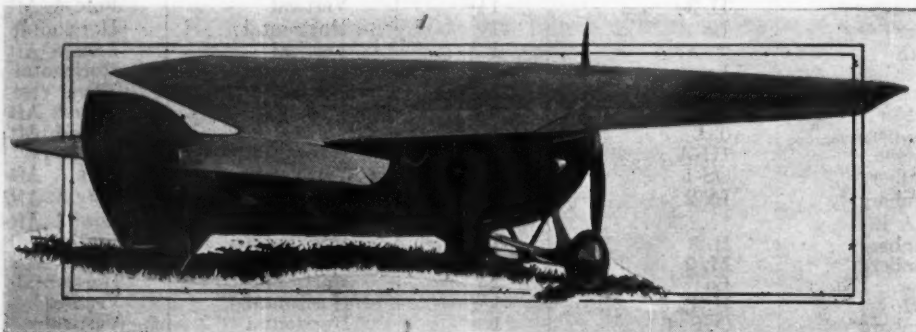
The Crescent Motor Co., Fond du Lac, Wis., is under new management, John D. Giddings, president and general manager, having disposed of his interests. The new officers are: President, Robert Zinke; vice-president, E. R. Zam-zow; secretary and treasurer, A. R. Zinke.

The Federal Tire & Supply Co., Milwaukee, has incorporated its business with a capital stock of \$175,000. It is distributor of the Federal tire in Milwaukee and vicinity. The owners are Arthur L. Grede, Herbert A. Ruhnke and Henry C. Grede.

The Hudson Motor Specialties Co., of Philadelphia, manufacturers of the Hudson crank case repair arm for Ford cars, have been granted a design patent on "Crank Case Repair Arms."

The Kelsey Motor Co., of Newark, N. J., at its annual stockholders meeting elected the following officers and directors: Officers: Ernest B. Slade, president; C. W. Kelsey, vice president; Thomas J. Stewart, treasurer; F. D. Dorman, secretary and assistant treasurer. Directors: E. J. Churchill, A. E. Jennings, John R. Thomas, Charles W. Hoyt, Charles Abbott, E. I. R. Cadmus and L. S. Tyler.

Bat-Wing Monoplane Has Low Landing Speed



Final flying tests have just been completed by the Stout Engineering Laboratories on their new commercial type monoplane; an inclosed aerial sedan, which is a further development of the so-called bat wing machine, built by Mr. Stout for the Government during the war. In the flying tests the plane flew at a maximum speed close to 120 miles per hour, yet made landings at 40 miles per hour. Mr. Stout was formerly on the editorial staff of Motor Age.